ERRATA.

PAge 6. for *omitted*, r. emitted, p. 14. l. 2. *of* left out.

ADVERTISEMENT.

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Experimenta & Observationes

PHYSICÆ:

Wherein are briefly Treated of

SEVERAL SUBJECTS

Relating to

Natural Philosophy

IN AN

EXPERIMENTAL WAY.

To which is added,

A small Collection of STRANGE REPORTS.

By the Honourable ROBERT BOYLE,
Fellow of the *Royal Society*.

LONDON,
Printed for John Taylor at the *Ship*, and John Wyat at the *Rose* in S. *Paul's Church-Yard*. MDCXCI.

A Letter that may serve for a Preamble.

To my Learned Friend Mr. H. Oldenburg (*Secretary to the Royal Society.*)

SIR,

BEing at length come to a Resolution, I have already done something more than barely entred upon that way of Writing, that you and I have more than once Discoursed of together; and wherein you *particularly* (tho not you *only*) among my Learned Friends, have wish'd to see me Engaged.

'Tis not, that I am insensible of the Prejudice which the things I deliver are like to sustain, by the disadvan-

tageous Dreſs wherein they muſt appear, in the way of Writing I have pitch'd upon; which being for the moſt part plainly Hiſtorical, and ſet down in the order wherein they chanc'd to come to hand, denies moſt of them, not only the uſual Ornaments of other Books, but the allowable Advantages, that Method, elaborate Diſcourſes, neat *Hypotheſes*, and ſubtil Diſputes, are permitted to bring even to Philoſophical Writings.

But theſe Conſiderations were over-ſway'd by a ſad one, founded upon the (yet continuing) condition I was in, when I was Debating this matter in my Thoughts. For it having pleaſed God (to whoſe always moſt juſt

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Diſpenſations Men ought entirely to ſubmit) to Afflict me with the Stone and the Palſy; as on one ſide, theſe, added to a ſufficient number of Avocations, ſcarce permit me any great expectation, of finiſhing in a ſhort time the Tracts I had made a leſſer or greater Progreſs in, according to my firſt deſign; ſo on the other ſide, my Friends judging it unfit, that the Materials provided for theſe more than begun Treatiſes, ſhould be quite loſt, or kept too long uſeleſs, it ſeemed expedient, that as Opportunity ſhould from time to time ſerve, I ſhould look over my Memorials, and other ſcatter'd Papers, to take notice what Experi-

ments and Obſervations were to be found in them.

Upon theſe, and the like inducements, having pick'd up ſeveral of my diſperſed Papers, ſome of them Written many Years ago, and ſome of a leſs ancient date; I began to refer the moſt part of what I found Hiſtorical in them, together with ſome few things that did ſeem neceſſary not to be ſever'd from them, to certain Heads or Titles which I called Chapters; and made them the more numerous, that they might ſingly be the leſs Prolix: And about theſe I muſt deſire your leave to repreſent ſome things, by way of Preface.

And firſt, ſeveral of the enſuing Particulars that I met

met with among my Papers, being parts of Essays or other Discourses, and being for haſt Transcribed for the moſt part *Verbatim*, as they were couched there; I dare hope for your excuſe, if among ſuch Tranſcripts you now and then meet with things, which, how pertinent ſoever to the Tracts they firſt belong'd to, might have been ſpared as needleſs, if not ſometimes Forein; alſo, in the new Form the Diſcourſes are now put into; ſince I could not leave out ſuch unneceſſary Clauſes (whereof yet I hope you will not find many) without too much mutilating the coherence, or obſcuring the

ſenſe of what is delivered; and I could not alter them, and adapt others to ſupply their places without ſpending more time, and taking more Pains, than in the condition I am now in, I ſuppoſe you would be willing to condemn me to.

Next, I deſpair not but you will allow me the Liberty I have taken, to vary the Bulk and Method of particular Chapters, as my occaſions would permit, or the plenty or paucity of Materials ſuggeſted; or the Nature of the thing I treated of, and the Scope I propoſed to my ſelf in Writing of it, ſeem'd to require. But ſometimes my want of Health and Leiſure, and

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my desire to hasten to other subjects, that either pleased me better, or seem'd more considerable, made some of the following Chapters, compared with others, but short; especially, if I were supplyed but with a number of things pertinent to that Subject, by the Papers I had then in hand, how much soever I may have Written of it in other Papers, which I hope hereafter to be Master of.

And this Advertisement may render you a Reason why to the Title of some of the Chapters I have subjoyned the first Section, tho it be not at present followed with a second.

And, as for my having

imployed very differing Methods in ſome of the enſuing Tracts, I did it with deſign, as judging ſuch a variety of Method more conducive to my purpoſe, than Uniformity in it would have been. For, beſides that ſome of the Treatiſes, whence theſe Chapters were taken, did, by the ways wherein they were already Written, oblige me, to accommodate my ſelf to their Method; I thought, that if you ſhould ſhew theſe Papers to any, that are very unacquainted (which I have heard you complain, that too many are) with the way of accommodating in ſome tolerable manner, his Enquiries and his Writings to

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the ſeveral Subjects he applies himſelf to, he may be ſomewhat helped, by the differing Examples he may here meet with, to make variations ſomewhat ſuitable to the differing Natures of the Subjects he deals with.

But here I muſt beg you to take notice, That, tho in compliance with this deſign, as well as for ſome other reaſons, *I* have in ſeveral of the following Chapters given intimations and hints of things, which *I* do not there proſecute; and now and then propoſe ſome Conjectures and Opinions, whoſe proof *I* do not inſiſt on; yet *I* am not willing you ſhould think, that, however ſome of thoſe paſ-

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ſages may be but occaſional things, mentioned principally to excite, and give hints to the inquiſitive and ſagacious; yet all, or moſt of them, are of the ſame kind; and that *I* thought not on them, but as ſlightly and tranſiently as *I* mentioned them; and have no better and other Reaſons to alledg for my ſuſpicions or intimations, or even for my conjectures or my opinions, than thoſe you will meet with in Papers haſtily drawn up; eſpecially ſince, *I* think, *I* can ſhew you divers of the things deliver'd in thoſe paſſages, enlarg'd and render'd at leaſt probable or practicable in other Diſcourſes, that for

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certain Reaſons do not accompany theſe *I* now ſend you.

I expect, that you ſhould think it ſomewhat ſtrange, to find many of the following Experiments ſet down much leſs circumſtantially than thoſe that are mentioned in the *Phyſico-Mechanical* Experiments touching the Air; in the Continuation of them; in the Hiſtory of Cold, and in ſome other Books of Mine that you have been pleas'd to peruſe. But on this occaſion give me leave to repreſent to you, that the nature of divers of the former Experiments, eſpecially Chymical ones, and my aims in mentioning them, being con-

considered, it seem'd not requisite they should be more fully Treated of: And as for others, tho the brevity and dispatch, which divers reasons made me propose to my self, had not forbidden me to amplify; yet I daily feel my Leisure, not to say my Life too, so torn in pieces from me, by Sickness, Visits, Business, and inevitable Avocations, that I am frequently admonished to hasten the securing of as much as conveniently I can, by dispatching particular Subjects, and am quite hindred from dwelling so long upon them, as, if I had more Health and Leisure, I should willingly do. To these things perhaps, so favourable

vourable a Person as Mr. *Oldenburg* will add, that the Characters which Learned Writers, *English* and *Forein*, tho divers of them personally unknown to me, have been pleased to give of the diligence and sincerity employed in setting down the *Physico-Mechanical* Experiments, and those of some other Writings of Mine, may permit me to hope, that it will be thought, that, after having been divers years vers'd in making Tryals and Experiments, *I* have made them with some care and wariness, and mentioned them faithfully, where *I* have not done it amply; upon hopes it may be taken in good part from a Person

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in my preſent condition, that was never a Profeſſor of Philoſophy, nor ſo much as a Gown-man; to have made ſhift to make the Experiments and Obſervations he communicates, and ſet them down truly and candidly, without fraudulently concealing any part of them, for fear they ſhould make againſt him. And tho perhaps you will eaſily believe, that in divers of the Experiments which I have but briefly mention'd, I have been as diligent an Obſerver of Circumſtances, as I was wont to be when I made thoſe, which have had the luck to be taken notice of for being fully related; and tho it may be alſo, that

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ſome Scruples or Objections, which my brevity may in part occaſion, were not unforeſeen by me, and might have been avoided by a more copious and diffus'd way of Writing; yet I purpoſely decline ſuch a way of delivering things, not only for the reaſons above mention'd; and becauſe I ſuppoſe them that may peruſe theſe Papers, to be acquainted with my formerly Publiſhed Writings, and to have either from them, or otherwiſe, underſtood the way of making ſuch Experiments as mine; but alſo, becauſe, tho *I* wanted Time and Health, much leſs than *I* do, *I* ſhould not think it fit too much to prevent the

the Induſtry of others about the Tryals *I* mention; and reap the Field ſo clean, as not to leave them, not only ſtore of Ears to Glean, but ſome corners of ſtanding Corn. *I* have therefore here and there purpoſely omitted, both, ſome not abſolutely neceſſary Practical Directions about making of Tryals, that might prevent ſuch Scruples or Objections, as have the Grounds of anſwering them clearly deliver'd in my Printed Books; and ſeveral, not only leſſer Circumſtances, but conſiderable *Phænomena*, and obvious Applications, that may probably occur to others, as they did to me in making the Tryals and Reflecting on them.

Adver-

Advertiſements about the Diſpoſition of the following Treatiſe.

YOU *will quickly diſcern that the following Chapters could not be intended for compleat Tracts, about the Subjects handl'd in them. And indeed they were intended but for ſuch* Memoirs *about the Various particular Subjects they Treat of, as may be ſerviceable to the Solid Natural Hiſtory that has been nobly deſign'd and is ſtill proſecuted, by the Royal Society. Wherefore ſince (at leaſt in our Age) no Writer that I know of, has ſo early and ſo well, both urg'd the neceſſity of Natural Hiſtory, and promoted divers Parts of it by Precepts and* Specimens, *as the illuſtrious Lord* Verulam; *I ſhall not ſcruple in the way or manner of Writing theſe ſhort Collections of mine, to make uſe ſomewhat frequently of his Authority and Examples; but without Confining my ſelf to either.*

I. *Agreeably to this Advertiſement you will find, that ſome of the Particulars that the following Treatiſe conſiſts of, are ſingle and as it were, Independent ones; upon which account they reſemble thoſe which in the* Verulamian Sylva, *or Natural Hiſtory, are call'd* Experiments Solitary: *And have for that reaſon induc'd me to give that Title*

to each of the ſeveral Chapters that are made up of them.

II. *Another ſort of Chapters there is, wherein divers Experiments and Obſervations, all of them relating to the ſame Subject or Purpoſe, are ſet down together. Theſe if they were rang'd and ſorted in order to diſtinct Theories, I ſhould call, in imitation of the mention'd Author,* Experiments in Conſort. *But my backwardneſs to frame Theories has made me chuſe to forbear as yet to methodize them, and therefore has made me think fit to call them only* various Experiments *and* Obſervations *about this or that Subject (which they belong to.)*

III. *My haſt, tho not that only, induc'd me to make one ſort of Chapters more, that partly agrees with, and partly differs from each of the two that I come from mentioning: For in every one of theſe Chapters, there are two or three, if not more, ſingle or* Solitary Experiments; *and there are alſo others that have ſome kind of* Connexion *among themſelves, as being referable to the ſame Subject or Purpoſe. On that ſcore the Title that is given to each of the Chapters of this Third ſort, is that of* Miſcellaneous Experiments; *and ſometimes (but ſeldomer) of* Promiſcuous Ones. *And all the Particulars that I refer to the three forementionꝰd Heads, are caſt into* Chapters, *wherein the ſeveral kinds are di-*

distinguish'd only by their Titles, *or not.*

IV. *There is one Advertisement that regards all the sorts of Particulars that are refer'd to the forementionʼd Chapters, which is, that I have usually comprehended Observations, as well as Tryals, nuder the Title of Experiments; which I have done, not only upon the Authority, and in following the Example of our Judicious Chancellor (as is every where obvious in his* Sylva Sylvarum*) but for other reasons too. For both the sorts of Particulars may pass for matters of Fact, and so are Historical, taking the word in a lax sense, and the imploying it in that sense, makes the Articles or Passages, whereof the Chapters and other parts of our Collection consists, much more commodious for References and Citations.*

V. *Besides the three forementionʼd kinds of Chapters, you will meet in the ensuing Treatise with another sort of Writings, whereof some are almost entire, and others Fragments of larger Discourses. In neither of these, I did confine my self so much to matters of Fact, as in those Chapters that consist of* Experiments *and* Observations; *but took the liberty, as occasion requirʼd, to inlarge in Discourses, and sometimes to Cite such passages out of other Mens Writings, as I judgʼd I could make some pertinent Application or use of, perhaps unthought of by the Author.*

And

And these Papers being most, if not all of them Written in a more free and discursive way, I thought fit to separate them from the Sets of Collections that are almost merely Historical; and accordingly I have not styl'd them Chapters, *but* Titles; *and have forborn to assign them, as I did the others, Ordinal Numbers; which I desire likewise you would not prefix to any of them, because I am not yet resolv'd how I shall dispose of them, either by supplying what is wanting to finish any one, or more of them, or by taking to pieces, and imploying those pieces as Materials for other Tracts.*

VI. *Perhaps I shall not be thought to need Pardon, if to comply with their Curiosity, who affect most those* Experiments, *that are either uncommon, or teach them to do or perform something useful or pretty; I sometimes prefix a Title declaring what it treats of, to a particular* Experiment (*or* Obſervation,) *which for its Importance, Novelty, or Usefulness (Theorical or Practical) may deserve to be distinguish't; since by this means such Particulars may be the better impreſt on the memory, to gratifie those, whose nicety or want of leisure, may make them well pleas'd by a transient view of the Titles we speak of, to find such Passages as they chiefly look'd for, with less trouble than that of perusing an* Index.

VII. *Among the Experiments our Collection consists of, there is here and there one, to which it was thought fit to add something, either by way of Explication, or of Illustration, or of Confirmation, or of Answer to Objections, or of Theorical Reflection, or of Practical Application,* &c. *And these Supplements or Additions it was thought fit to call sometimes Annotations, but oftner* Scholiums, *because that Term is freely us'd in a very comprehensive Sense by Mathematical Writers. But tho I readily acknowledg that this Term has been chiefly imploy'd by Mathematicians, yet the use of it has not been so confin'd to them, but that good Authors in other parts of Learning have not scrupl'd to imploy it, as may appear by the* Scholiums *that some Learned Physicians have Written upon* Hollerius, *an eminent Person of their Profession; as also by the Example of the famous and Experienc'd* Foreſtus, *who has not seldom subjoin'd* Scholiums, *even to his own Medicinal* Observations.

VIII. *The mention of these* Scholia *prompts me to tell you, I had almost forgotten, but yet must not leave unmention'd, that I thought fit now and then to premise to Sets of* Experiments, *and sometimes (tho more seldom) to a single* Observation *a short Preamble by way of Introduction, which may often excuse the need of subjoyning a* Scholium; *and may be warranted by the Example of the Lord* Verulam

Verulam *in his* Centuries, *wherein he often inſerts ſuch ſhort Preambles, as things fitted to give light to the* Experiments *they belong to, and to give ſome Advertiſement both of the Nature and Importance of the Subject, and of the Scope of the Writer, or of other uſeful circumſtances.*

IX. *If among my own Experiments, namely, thoſe that I have made or ſeen, I have ſometimes inſerted* Experiments *or* Obſervations *that are not ſo: I have not done it without reaſon, and am authoriſ'd in that Practice, by frequent Examples afforded me by the firſt, if not only Author that I know of, that gave us a Set of Precepts of well writing Natural Hiſtory, our often cited* Verulam, *whoſe Centuries do in great part conſiſt of borrow'd* Experiments *and* Obſervations; *without which, he was ſenſible that his* Sylva *muſt be of too narrow a compaſs, or too thinly ſtock't with Plants, eſpecially with Trees. And indeed 'tis not to be expected, that, as the Silk-worm draws her whole Manſion altogether out of her own Bowels, ſo a ſingle man ſhould be able to write a Natural Hiſtory out of his own Experiments and Thoughts. And he that will ſtrictly confine himſelf to thoſe, will be often reduc'd to omit things very pertinent, if not neceſſary, to his Subject, which is of practice ſtudiouſly declin'd by me, who prefer the Readers Utility, to the ambition'd*

Glory

Glory of being thought to borrow nothing from any Body. And I can add in my Defence, at leaſt my Excuſe, that I have made uſe but a ſmall part of the Liberty allow'd me by the Example of ſo great a Guide in the way of Writing Natural Hiſtory. For I have very much ſeldomer than he, employ'd the Tryals of others; and have yet ſeldomer mention'd unverifi'd Reports or vulgar Traditions, being careful that the Bulk of the Matters of Fact I deliver, ſhould conſiſt of things, whereof I was my ſelf an Actor, or an Eye-witneſs; and that the comparatively few borrow'd Experiments that I added, (that I might not deprive my Reader of ſome things very pertinent and uſeful to my Subject) were receiv'd from Perſons of very good credit; beſides that I do not only frequently give ſufficient Intimation in the Experiment *or* Obſervation *its ſelf, but oftentimes by placing the Letter* C *in the Margent, do give notice; nay, and ſometimes to a whole Set, prefix the Title of Communicated* Experiments *or* Obſervations.

X. *I have nothing more to give you notice of* here, *ſave that, whereas you will find that I Write but on one ſide of the Leaves, whereof this Book* * *conſiſts: I did ſo for two Reaſons. The* Firſt, *That in caſe I ſhould*

* This refers to the Manuſcript that was ſent to Mr. *O.* and is left to ſhew the Intention of the Author.

ſhould have occaſion to imploy any of theſe Experiments in other Treatiſes, for which I am more concern'd than for this Rhapſody, I might have room to Subſtitute, if it ſhould be thought fit, one or more of my later Experiments in its place. And Secondly, *That I might have room, if I can get leiſure, to Write* Annotations, *or make* Reflections, *or* Illuſtrations, *or* Corrections, *or in a word, ſuch* Additions *and* Alterations *of particular Experiments and Paſſages, as they ſhall be thought to* deſerve *or* need.

I am ſenſible that this Preamble, increas'd by the Advertiſements that 'twas thought neceſſary to annex to it, is of a length that may ſeem diſproportionate to the Book or Tract 'tis prefixt to. But I may in excuſe of this repreſent to you, that the Bundle of Writings you now receive, is but a part of the Book; to which, if God vouchſafe me Health and Leiſure, this Preface inlarg'd by its Appendix, is deſign'd for an Introduction. And in that caſe 'tis hop'd that theſe Preliminaries, as many as they are, will not be thought Impertinent, or needleſly prolix.

Experi-

Experimenta & Obſervationes

PHYSICÆ.

TOME I.

CHAP. I.

CONTAINING

Chymico-Magnetical Experiments and Obſervations.

THE Loadſtone, *Pyrophilus*, is ſo admirable a Body, and its Uſefulneſs to Mankind is already ſo great, without denying us hopes of farther Improvements;

ments ; that I think we muſt want Curioſity or Gratitude, if we neglect either *to* take notice of any Experienc'd *Phænomena* that directly relate to ſo abſtruſe a Subject, or, by conſigning them to Paper, *to* preſerve them from Oblivion. 'Tis chiefly by this Conſideration, *Pyrophilus*, that I am induc'd to mention to you the following Experiments and Obſervations, made moſt of them by the help of the Fire. For, tho ſome of them may ſeem but ſlight; yet they may not prove unuſeful, towards diſcovering the Nature of a Body ſo ſtrange and ſingular, that, for ought is yet manifeſt, any true Magnetical *Phænomena* may ſomewhat conduce to the knowledg of it, And I was the rather induc'd to make Tryals and Obſervations of this Kind, becauſe moſt of them are ſuch as I have not met with in Authors. And the few that remain, I have not found ſufficiently taken notice

of

of there; Philoſophers and Mathematicians aymíng chiefly, in their Magnetical Writings, to proſecute and apply the Attractive and Directive, and perhaps the Inclinatory, faculty of the Loadſtone. Whereas, throwing into another Paper, what I Obſerv'd, of that kind, I did in the preſent Inquiry mainly intend to make the Loadſtone rather the Object than the Inſtrument of my Tryals: and handling chiefly the very Subſtance of the Stone, endeavour not ſo much to Advance or Apply its Faculties, as to Weaken and Deſtroy them, tho in order to the better knowing of them. Having therefore procured a conſiderable number of, for the moſt part naked (or uncapt) Loadſtones, moſt of them Courſe, but of differ.ng Sizes, Shapes, Colours, and Countries; I made upon them ſeveral Tryals, ſome of which I ſhould immediately proceed to give you a brief Account of, but

that 'twill be proper to premiſe this ſhort Advertiſement: That, I would not have the Title of theſe Experiments make you expect, that the Fire ſhould be a main Agent in every one of them, ſince to preſerve ſome few of them, I refer them hither, tho an actual Fire was not Imploy'd to make them: Since the common Rule that *a potiori parte fit denominatio*, will ſuffice to Warrant, or at leaſt excuſe, my giving to this ſmall Collection the Title of *Chymico-Magnetical Experiments*; becauſe the greateſt part were perform'd by the help of the Fire, or Bodies Chymically prepar'd by the Application of it. And becauſe 'tis uſual with the beſt Writers about Magnetiſm, to reckon Steel and Iron among Magnetical Bodies; I ſhall not ſcruple to deliver in this Paper ſome Experiments, made by the help of the Fire upon thoſe Subjects; with reference, nevertheleſs to Magnetiſm.

EX-

EXPERIMENT I.

Having Ignited ſeveral Load-ſtones, and removed them from the Fire till they grew Cold again, I found a great diſparity in the viſible ſubſtance whereof they conſiſted, and the manifeſt ſtructure of the groſs parts that made them up. For *ſome* Stones upon Refrigeration, either fell aſunder of themſelves, or grew very Brittle; when as *others* ſtill continued in their entireneſs: *Some* of them being broken look'd not unlike Iron-Ore, or Stones which I have gather'd near Iron-Mynes in *Kent*; *others* being broken, after Refrigeration appear'd to conſiſt of Plates or Flakes of ſeveral Colours, and lying Parallel to one another: And *others* again, which as I remember were Engliſh ones, did neither appear to be compos'd of any ſuch Flakes, nor had their dark Colours much, if at all

chang'd by the operation of the Fire, nor did ceaſe to be Solid Bodies.

EXPERIMENT II.

We could not upon the Burning of ſeveral ſmall Loadſtones one after another, diſcern any ſuch blew ſulphureous Flame as *Porta* in his Natural Magick relates himſelf to have ſeen, and judges to have been as it were the Soul of the Loadſtone, upon whoſe receſs he ſays, it loſt its Magnetick Faculty, which is *moſt commonly true as to any conſiderable degree of the Coitive or Attractive Power*, but not of the Directive Faculty or Vertue. But it may be that *Porta* miſtook the ſmall Flame, which is often omitted even by well-kindled and glowing Charcoales, (on which ſort his Loadſtone was placed) eſpecially when a little blowen upon, for the ex-

Lib. 7. Cap. 7.

exhaling Soul of the Loadſtone; or elſe, to be civil to him, we may ſuppoſe, that, His Stone was more rich in Unctuous Moiſture than Others are wont to be; and if we had had by us a very exact pair of Scales, we ſhould have endeavoured to have by them diſcovered, See Exper. 10. whether the Fire do deprive Loadſtones of any ponderable parts.

EXPERIMENT III.

The Solidity of ſome Engliſh Loadſtones, made me think it fit, tho I look'd upon them as a kind of Iron-Ore, to try whether they could not be brought to ſtrike Fire. And accordingly, having made divers Colliſions betwixt a rough pei e, and the ſteel of a Tinder Box; I found that with much ado it was poſſible to obtain ſome Sparks, (tho they ſeem'd but ſmall ones:) But hav-

ing taken a large peice of ſmooth Loadſtone, I found that, by ſtriking it ſomewhat briskly, with the edge of a ſteel'd Hammer, we were able to produce good ſtore of Sparks, and ſome of them of a ſurprizing bigneſs; for they were judged to exceed the ſize of thoſe that are uſually afforded by common Flints.

EXPERIMENT IV.

For certain Reaſons I thought fit to make a further Tryal, being deſirous to ſatisfie my ſelf, whether it were not poſſible, to make Loadſtones afford Fire without the help of Iron or Steel. And being willing to comply with this Curioſity, I made choice of two ſolid peices of Loadſtone, that were cut almoſt into the form of Cubes; and found that many Colliſions being made between them, eſpecially at the edges; there were produced from Time

to Time, (tho not frequently,) ſome Sparks of Fire, tho neither ſo numerous, nor ſo great or vivid, as thoſe of the foregoing Experiment wherein the Steel was employ'd.

EXPERIMENT V.

I have (elſewhere) formerly related, that if an Oblong Loadſtone made glowing hot, be refrigerated Perpendicularly, the lower extream will thereby become its Northern Pole. And I ſhall now add, that yet if ſuch a Loadſtone be refrigerated Perpendicularly, not upon an ordinary Terreſtrial Body, but upon the Northern extream of a much ſtronger Loadſtone; in ſuch caſe, this debilitated Stone will receive its Impreſſions, as if it were an Iron, and its lower extream will not be, as before, by the Magnetick *Effluvia* of the Earth, made its Northern Pole; but it will be con-

contrariwiſe animated by the Pole of the Loadſtone, on which 'tis cool'd; and according to the Laws Magnetical, the lower extream of it, will not be its Northern, but its Southern Pole, nimbly attracting the North end of an excited and Æquilibrated Needle.

EXPERIMENT VI.

By the forementioned way of Refrigeration I alſo found, that a Diſanimated Loadſtone (if I may ſo ſpeak) may be reſtored, to ſome degree of its Attractive Vertue; for I try'd that a ſmall Loadſtone, which after its being made red hot in the Fire, and cool'd Perpendicularly upon the Ground, was not able to take up a fragment of a Needle; being again heated, and not only cool'd upon the Pole of a ſtrong Loadſtone, but ſuffered to reſt on it a while after, was ſoon grown vigorous

gorous enough, to take up what formerly it could not move.

EXPERIMENT VII.

I further obſerv'd, that tho a Loadſtone that had paſs'd the Fire, had not, by being immediately before made red hot, had its Body open'd and fitted to take in plentifully the Magnetical Streams; yet it would, like a wire of Iron, acquire a new Verticity from the vigorous Loadſtone; but not be in many Hours ſo vigorouſly impregnated with Magnetick vertue, if it were applied cold to the Pole of the Animating Loadſtone; as it would in a very ſhort time, if being glowing hot it were refrigerated thereupon.

N. B. It has been obſerv'd, that if a Loadſtone be made red hot in the Fire, it will ſcarce retain any ſenſible Attractive vertue, ſave

ſave that it will be able, by being endowed with a Magnetiſm from the Earth, to drive away that Pole of a Needle well poys'd, which agrees in Denomination with that Pole of the Loadſtone, which is applied to it. But I deſire that it may be remembred, that I intimated that this is not ſtrictly and univerſally true; for in ſome of our Engliſh Loadſtones, it has been obſerv'd, that Ignition does not only leave them capable of a Directive Vertue, but leaves them alſo a conſiderable Attractive power, ſo that they will ſuſtain a good weight of Steel (as will appear hereafter.)

EXPERIMENT VIII.

We took three Engliſh Loadſtones that appeared to be of a very compact Subſtance; two of them very ſmall, as not being of near half an Inch in length; the other much greater, being about

about an Inch long, and of a conſiderable breadth, but yet of ſmall thickneſs: Theſe we made red hot in a Fire of well kindled Charcoal, and being thorowly Ignited, removed them one after another, and haſtily ſet each of them upon a Plate of Silver (for neither Wood nor Iron would have been convenient) and applying the Loadſtone (Capp'd) to each of them, whilſt it was yet red hot; it ſeem'd manifeſt enough, not only, that whilſt it was in that ſtate, the Stone had not ſo ſtrong an Operation on it, as if it were not red hot: But, which is remarkable, when it ceas'd to appear *Ignited*, but yet was intenſly *hot*, (ſo that it was readily able to burn his Fingers that ſhould offer to take it up between them) the armed Loadſtone had a more powerful Operation on it, by way of what they call *Attraction* and *Suſtentation* (not only, as I ſaid, than it had, whilſt the Ignited

Stone

Stone conſpicuouſly retain'd the colour Fire, but) than it had, after the ſame Stone was grown cold.

EXPERIMENT IX.

This Experiment was reiterated with the two ſmaller Magnets and the greater, with the like ſucceſs: And when the Magnets were grown cold, they did notwithſtanding their having been twice ignited, diſcover ſome little Magnetiſm, if apply'd to the end of a well-excited Magnetick Needle, nicely poys'd upon the point of an ordinary Needle [or braſs Pin] (on which its Center of Gravity lean'd.) And I found that the bigger of the three forementioned Loadſtones, after the firſt, if not alſo after the ſecond Ignition; did not only move the Magnetick Needle more briskly than one would have expected, but, (which may

may seem strange) being thrust into filings of *Mars*, and then taken out, it carried up with it and sustained a considerable Number of them. Whence we may conclude, that in some Loadstones of a very solid Constitution, such as this was; the Magnetical vertue is more Radicated (if I may so speak) or Permanent, than in the generality of other Magneticks. This Stone being the first wherein I observ'd, after I had thorowly Ignited it, any Attractive vertue able to take up Filings of Iron.

EXPERIMENT X.

On occasion of these Tryals I made another, which tho to some it may seem but slight, I thought the more worthy to be made, because I remember not to have read or heard of it before; we took then, the same Loadstone that we employ'd about the

the last Experiment, and having again made it red hot, in the Fire, suffered it not to cool leisurely in the Air, as before, but quenched it, in a Bason of cold Water; intending thereby to make a double variation of the Experiment, *first*, by cooling it Hastily, and as it were Abruptly; and *next* by cooling it not in the Air, but in a Fluid some hundreds of times more Dense or Ponderous than the Air. The Event of the Tryal was, that, upon the Immersion of the red hot Stone, there fell off some flaky matter, as if it had been Scales of *Mars*; and the Stone, when cold, would not take up any filings of Iron, as before it did many; so that it appear'd to have lost much of the Vertue it so lately had, tho it retain'd the Power to move a well-poys'd Needle, if it were held near to either side of the point of it.

EX-

EXPERIMENT XI.

A black Oblong Loadſtone, of a Homogeneous Subſtance, and weighing near three Drams, having been in a Fire of well-kindled Charcoals, Ignited, and continued ſo for ſome Minutes of an Hour; being weighed again as ſoon as it was cool'd, was found to have loſt about ½ of a Grain of its firſt Weight, and much of the blackneſs of its Colour.

Tho the Affinity between the Loadſtone and Iron, might make one expect that the Fire might have a like Operation upon this Stone, and that out of which Iron is commonly melted, both being indeed Iron-Oars; yet for ſome Reaſons that I cannot now ſtay to mention, I was induc'd to think, that the Effect of Ignition upon thoſe two Bodies might be very differing, as I conceive their Internal and unſeen Texture to

be. And therefore I made the following Experiment.

A Lump of Iron Oar, which look'd almoſt like a white Stone, rather than a common Oar, and was about the bigneſs of two Eggs; being apply'd, in ſeveral of its parts, to an excited Needle, did not appear to move it manifeſtly. But being afterwards made glowing Hot, and kept ſo for a while, and then Refrigerated; it did in thoſe parts, which ſeem'd by their newly acquir'd Colour to abound with Metalline Corpuſcles; it did, I ſay, manifeſtly Attract the North end of the Needle. And this was tryed, both with a Needle of our own touching, and by the Mariners Needle of a Sun-Dyal; whoſe *Flower-de-Luce*, the burnt Oar did manifeſtly draw.

EX-

EXPERIMENT XII.

To confirm the former Obſervation, and alſo what I elſewhere gave notice of, That divers Bodies are of a Magnetical Nature or have in them ſome parts that are ſo, which yet are not vulgarly believ'd to be referable to that ſort of Bodies; I ſhall ſubjoyn the following Experiment.

A Brick that had not been us'd, was ſaw'd long ways into two equal pieces, and each of theſe (one at one time, and another at another) was heated red hot in the Fire for a pretty while, and afterwards ſuffer'd to cool North and South: And, as I expected, it thereby acquired a Magnetical Verticity; and with that end that in cooling reſpected the South, did a little, tho but faintly, draw the *Flower de Luce* (which pointed out the North) of the Mariner's Needle; and with

the other end, did ſomewhat more vigorouſly drive the *Flower de Luce* away, and a little attract the other Extream of the Needle.

EXPERIMENT XIII.

We took a [black] Loadſtone, and having by degrees beaten it ſmall, without ſuffering it to touch any Iron or Steel Veſſel or Inſtrument, [which becauſe of the hardneſs of the Stone, was very troubleſome to do;] we ſet aſide the groſſer Grains for other uſes, and upon ſome of the finer Powder we pour'd the Spirit of common Salt, which had at firſt a ſenſible Operation upon it, by producing fœtid Fumes, and making a kind of Ebullition, as that *Menſtruum* is wont to do upon filings of Iron or Steel. But nevertheleſs, being kept a Night or two in Digeſtion, it drew a high Tincture; and tho this was not at all, like the Solutions of Mars in Spirit

rit of Salt, Green, but of a Yellowiſh Brown, not very remote from Redneſs: Yet a little of it being dropt into a freſh and ſufficiently coloured Infuſion of Galls, turned it preſently into an Inky Subſtance, which in ſome Poſitions appear'd blewiſh, as a Tincture or light Solution of *Mars* would have done. I ſhall only add, about the Solution of Loadſtone, that having carefully made it with a good *Aqua regia*, obtain'd a Solution, ſome of which you may yet command a ſight of, that by ſome *Virtuoſi* to whom I ſhew'd it, was thought either a fine Solution of Gold, or little, if at all, inferior to it in kind or Richneſs of Colour. I choſe to employ the Spirit of Salt, rather than that of Nitre or *Aqua Fortis*, in this Experiment; becauſe I found the firſt named Liquor to diſſolve Iron very well, if not better, tho leſs furiouſly, than *Aqua Fortis* it ſelf; and alſo, becauſe I could by this means bet-

ter judge of the Tincture of its Colour; having formerly found by Tryal, that Spirit of Salt makes a Green Solution of *Mars*; but *Aqua Fortis* or Spirit of Nitre, a Reddiſh one. And it was to judge of the Tincture of the Loadſtone, as well as for another purpoſe, that I was ſo careful to keep the Stone from touching Iron, when it was pulveriſing; leaſt by the Hardneſs of it, and the Sharpneſs of its Angles, it ſhould grate off ſome parts of the Metal, and ſo alter the Solution; for want of which Caution, I have known ſome Experiments about Artificial Gems to miſcarry; the Braſs Morter wherein the hard Ingredients were beaten, having communicated ſome Particles to them, that alter'd the Colour which the Maſſe after Vitrification would otherwiſe have been of.

EXPERIMENT XIV.

Some Parts of the foregoing Experiment may be confirm'd by that which follows.

I caus'd a weak Loadſtone to be heated red hot, to make it the more eaſie to be powder'd, and having caus'd it to be beaten very fine, I digeſted good Spirit of Salt upon it. (I afterwards found that ordinary Spirit would ſerve the turn) This in a few Hours acquir'd a Tincture not greeniſh, but almoſt like that of a troubled Solution of Gold. It ſtrongly reliſh'd of Iron, and a little of it being dropp'd into Infuſion of Galls, it turn'd it immediately into an Inky Liquor; part of this Solution being gently Evaporated, grew thick like an Extract, but did not ſeem diſpos'd to ſhoot into Chryſtals; yet another part of it did precipitate with Salt of Tartar, much like a Solution of Vitriol;

and another with Spirit of fermented Urine gave a plentiful, but yellowiſh red, Præcipitate.

EXPERIMENT XV.

Meeting among my looſe Notes, with one that may ſerve both for a Variation and Confirmation of what has been above delivered in the Experiments; it ſeem'd not improper to annex a Tranſcript of it.

A red Mineral, whoſe Conſiſtence was between Stony and Earthy, was by me judg'd to be a kind of Iron-Oar, tho having powder'd ſome of it, I could not find that a good Loadſtone would attract any part of it: Therefore, to ſatisfie my ſelf, and to confirm D. *B*'s Obſervation; about the Vertue of Linſeed Oyl, I caus'd this red Powder, wetted with that Liquor, to be kept about two Hours Ignited in a Crucible; by which means it was turn'd blackiſh.

iſh. This dark colour'd Powder was taken out, and ſuffer'd to cool, and then would readily adhere to the ſame Loadſtone, almoſt as if they had been a heap of filings of Iron. But the Operation of the Fire perhaps contributed, as much (or more) as the Linſeed Oyl, to this Change. For a parcel of the red Powder being kept Ignited in a Crucible, tho without the Liquor, did afterwards appear Magnetical.

After having ſaid thus much of the moſt *uſeful* of uncommon Stones, the Magnet: It will not, I preſume, be thought incongruous to ſubjoin ſome Remarks about the moſt *precious* of them that are known among us, *viz.* Diamonds; which will be done in the next Chapter.

CHAP.

CHAP. II.

CONTAINING

Various Obſervations about DIAMONDS.

DIamonds being generally eſteem'd the moſt Noble and Precious of Gems, and even of Inanimate Bodies here below, (for of Carbuncles, the very Exiſtence is diſputed;) the Opportunity I had of being one of the Committee or Directors of the Engliſh *Eaſt-India* Company, (whereto the deſire of Knowledge, not Profit, drew me) allow'd me in ſome meaſure to gratifie my Curioſity about them, by adding to ſome Obſervations of my own, the Anſwers

ſwers I had to the queſtions, I propounded to ſome *Eaſt-India* Merchants and Jewellers, that had Opportunity to deal much with thoſe Gems. Part of what I had learn'd about them, I committed from time to time to ſome Papers, which were the main things that ſupply'd me with the following Particulars.

Theſe Gems, (to add that upon the by,) may the rather deſerve our Curioſity, becauſe the Commerce they help to maintain between the Weſtern and Eaſtern parts of the World, is very conſiderable. For as ſmall as their Bulk is, their Properties and Mens Opinion, do ſo much recommend them, that I remember one of the moſt famous and intelligent Merchants of this Nation, (who has been Governor of more than one Trading Company in it,) being enquir'd of by me about the value of the Diamond Trade; he anſwer'd me, That according to his well-

well-grounded Eſtimate, there came from the *Eaſt-Indies* into *Europe*, one year with another, to the value of about 350000 *Sterl.* of which about 100000 *l.* came into *England*; which at preſent, becauſe of the prudent Indulgence of the Government, and of the *Eaſt-India* Company, is become the Mart of Diamonds.

I. To prove the great hardneſs of Diamonds, even in compariſon of other Bodies, that are thought wonderfully hard, a famous Artiſt for cutting of Diamonds, in return to ſome queſtions I put him, affirm'd to me, that he could not either Cut or Poliſh Diamonds with any thing but with Diamonds. And he further anſwered me, that if he ſhould employ ſo rough a way, and ſuch forcible Engines to cut Rubies or any other Stones, as he does to cut Diamonds, it would preſently break them in pieces; which the Inſpection of his Engine made very probable to me.

II. A

II. A very skilful Cutter and Poliſher of Diamonds (Mr. *L.*) being demanded by me, whether he found that all ſorts of Diamonds were of equal Hardneſs, told me, that having dealt in Diamonds near twenty years in *Amſterdam*, and divers years in *England*, he perceiv'd that there are of later years, brought over worſe and worſe ſorts of Diamonds; ſo that he judges thoſe of the old Rock (as he calls them) either to be quite ſpent in the *Indies* themſelves, or at leaſt to be ſeldom or never brought over to us. And he finds ſeveral of recent Diamonds, ſo ſoft and brittle in compariſon of thoſe of the old Rock, that he is oftentimes afraid, or unwilling to meddle with them, leaſt he ſhould ſpoil them in the Cutting or Poliſhing.

III. Notwithſtanding the (lately mention'd) wonderful Hardneſs of Diamonds, there is no Truth in the Tradition, as generally as

'tis

'tis receiv'd, that represents Diamonds as uncapable of being broken by any External force, unless they be soften'd by being steep'd in the Blood of a Goat. For this odd Assertion, I find to be contradicted by frequent practice of Diamond Cutters: And particularly having enquir'd of one of them, to whom abundance of those Gems are brought to be fitted for the Jeweller and Goldsmith, he assur'd me, That he makes much of his Powder to Polish Diamonds with, only, by beating board Diamonds (as they call them) in a Steel or Iron Morter, and that he has that way made with ease, some hundreds of Carrats of Diamond Dust.

IV. 'Tis an Opinion receiv'd among many that deal in Gems, that as Diamonds are the hardest of Bodies, so the same Compactness, and their great Solidity, gives them also a proportionable Gravity, and makes them extreamly weighty,

in

in reference to their Bulk: And I ſaw in the Hands of a *Virtuoſo*, a Book (that I could not procure) not long ſince put out by a French Jeweller, who as he affirms, has dealt very much in Diamonds; wherein the Author aſſerts, the great Ponderoſity of theſe Stones, in compariſon of other Bodies. But this Opinion agrees very little with the following Experiment, that I find among others, that I try'd about Gems, Regiſter'd to this purpoſe.

A rough Diamond ſomewhat dark within, did in a pair of Scales that would turn either way with the 32th part of a Grain, weigh 8 Grains, and eight Sixteenths. This Stone being with care weigh'd in Water, according to the Rules of the Hydroſtaticks; its weight appear'd to be to that of an equal Bulk of that Liquor, as $2\frac{15}{16}$ to 1. So that, as far as can be judg'd by this Tryal, even a Diamond weighs not full thrice as much as Water.

V. A

V. A famous and experienc'd Cutter of Diamonds, being ask'd by me, whether he did not find ſome rough Diamonds heavier than others of the ſame bigneſs, told me, that he did, eſpecially if ſome of them were Cloudy or foul: Inſomuch that ſhewing me a Diamond that ſeem'd to be about the bigneſs of two ordinary Peaſe or leſs, he affirm'd, That he ſometimes found in Diamonds of that bigneſs, compar'd together about a Carrat (or four Grains) difference in point of weight.

VI. The ſhape or figure of Diamonds is not ſo eaſie to be ſecurely determin'd. For thoſe that are ſeen in Rings and other Jewels, having been by way of Preparation cut and poliſh'd, have chang'd their natural Figures for that which the Artificer thought fit to give them. And rough Diamonds themſelves (which are not obviouſly met with) do oftentimes come to our Hands broken, tho unwillingly, by the Diggers.

Diggers. And thereby unfit to acquaint us with their genuine Shape, which we may alſo miſs of being able to diſcover, on account of the Accidents that the matter they conſiſted of was ſubject to, at their formation in the Mine. For to omit other Proofs, having had a Parcel of between 100 and 150 (if I miſremember not the Number,) put into my Hands at one time in the *Eaſt-India* Houſe to gratifie my Curioſity, I found very few of them compleatly ſhap'd; but moſt of them broken, and of very irregular Figures, like thoſe of ſo much Gravel taken up at adventures upon the Sea-ſhore. But ſome few I ſaw that were pretty regularly figur'd, which probably were not much hinder'd from ſhooting freely in the Wombs or Cavities, wherein they were Coagulated or Concreted. And theſe ſeem'd to conſiſt, in my opinion, of ſeveral Triangular Surfaces that were terminated in, or compos'd,

diverſe ſolid Angles. And one rough Diamond I had of my own, wherein this Shape was more conſpicuous than I remember to have ſeen in any other. Beſides having enquir'd of a very experienc'd Artificer, who dealt much in fitting theſe Gems for the Goldſmiths uſe, whether he found rough Diamonds to be of any conſtant Figure, and if he did, what that Figure was? He anſwer'd me, That he always found thoſe that had any conſtant, (or as he meant, regular) Figure, to be in his own Expreſſion ſix corner'd.

VII. Diamonds have in them a Grain (or a determinate tendency of their Fibres, or rather of the thin Plates they are made up of,) as well as Wood, and may with eaſe enough be ſplit along the Grain, tho not againſt it; as I have ſeen a very large Diamond that was cut according to the Grain into three pieces, whereof the middlemoſt, tho large and about

bout the thickneſs of a Shilling, was of an even thickneſs, and exactly flat on both ſides. I have my ſelf a Diamond-Ring, whoſe Stone I would not have poliſh'd, but caus'd it to be ſet rough as Nature produc'd it, becauſe in that ſtate the Grain is manifeſt to the naked Eye, and much more to a Glaſs moderately magnifying the ſeveral Plates it conſiſts of, having their Edges diſtinguiſhable like thoſe of a Book a little open'd. A Cutter of theſe Gems that has had ſtore of them to practiſe his skill on, anſwer'd me, That one good blow may ſplit even great Diamonds, if it be given, as they ſpeak, with the Grain; but againſt the Grain, he affirm'd to me, as dexterous and expert an Artificer as he is, that he is not able ſo much as to Cut or Poliſh them.

VIII. The common Colour of Diamonds being generally enough known by ſight, 'tis not needful, as it would not be to deſcribe it by

Words; but the moſt uſual Colour of theſe Gems is not the only, of which they may ſometimes be found. A great Traveller into the Eaſtern parts of the World aſſur'd me, That he had ſeen ſome of them that were of a pale blewiſh Colour: That famous French Jeweller as well as Traveller, Monſieur *Tavernier*, gives an account of a fair Diamond that he had of a very red colour; and that great Ornament of our Engliſh Court the D. of *R.* told me, that ſhe was Miſtreſs of a fair one, which tho not of a Ruby, was of a red Colour, but not having it at Hand, ſhe could not then ſhew it me: A Relation of mine, in the ſame Court, uſed to wear a Diamond Ring; which tho the Stone was not great, he valu'd at a hundred Pound, becauſe its Colour was of ſo fine a Golden yellow, that I ſhould have taken it for an excellent Topaz, but that he had ſatisfi'd me 'twas a Diamond to

which

which agreed its great hardneſs, which gave an uncommon Luſter. And I remember, that Surveying attentively a parcel of rough Diamonds newly brought from the *Eaſt-Indies*, I perceiv'd among them, beſides ſeveral lighter variations of Colour. One Stone that was all Green, and that to ſuch a degree, that I doubted not that if it were poliſh'd and ſet, it might paſs for an excellent Emerald; and I ſhould have ſuſpected this Gem to have been really of that kind, but that I found it among Diamonds that belong'd to Merchants too Skilful in thoſe Gems to be impos'd upon; and which was more, the Stone being yet rough and uncut, I found it plainly to have the proper ſhape of a Diamond.

IX. At the late return of the Ships from *India*, being preſent at the delivery of the Diamonds to the Owners, I obſerv'd one belonging to a *Dutch* Merchant whoſe

Father was a Cutter of Diamonds, and bred him to the ſame Trade. The Diamond came from the King of *Cholconda*, it was ſhaped (like mine) with ſix Triangular ſides, which yet were neither regularly figured nor truly flat, ſome of them being a little Convex, and one of them having a manifeſt and odly-figured Cavity in it. But the Diamond being fair and flawleſs, and ſo thick, that the Merchant told me it would be too deep for one Ring, and that therefore he meant to ſplit it into two. I had it weigh'd, and found it to amount to ten Charats (or 40 Grains). I could eaſily perceive the Grain of this Diamond, which the Merchant alſo acknowledged; who anſwer'd me, that he had never ſeen in Diamonds any Heterogeneous mixture incloſed. He further inform'd me, that there was brought him a large Diamond from *Borneo*, that was much darker than one I ſhewed him; in-

ſo-

ſomuch that he compared it to Soot; but when he had cut and poliſhed it, he and others were much ſurprized to find it a fair and clear Stone, of very great value.

X. The conjecture I have elſewhere propos'd, that divers of the real Virtues of Gems may be probably deriv'd from the metalline, or mineral tinctures, or other Corpuſcles that were imbody'd with the matter of the Gem, whilſt it was yet fluid, or ſoft, and afterwards concoagulated therewith: This conjecture, I ſay, may be much countenanc'd by the following Relation, which deſerves a place in this Chapter, by reaſon of its pertinency to the Subject of it.

I have long ſuſpected that the matter whereof Diamonds mainly conſiſt was, whilſt it was yet *in Solutis Principiis*, impregnated with metalline, and more particularly with martial ones: But by rea-

ſon of the dearneſs of thoſe Gems, and ſome other impediments, tho I have ben Maſter of ſeveral Diamonds of differing ſizes, cut, and uncut, yet I could never make a Tryal capable of ſatisfying my curioſity, till having lately met with among other little curioſities that lay long neglected by me, ſome number of ſmall Diamonds, that I had bought for Experiments; I conſider'd that their being yet rough, and ſo in their Natural State might make them more fit for my purpoſe, and ſo it might that they were not ſo clear as thoſe that we value in Rings, which probably argued their having more of Martial Tincture in them than I ſhould expect in the more Diaphanous: Upon this account, I ſay, I took a moderately vigorous Loadſtone (for 'twas none of the ſtrongeſt I have had) and apply'd it ſucceſſively to five or ſix of theſe ſmall Stones, without perceiving it had any Operation

tion on them: But when I came to apply it to one more, which look't ſomewhat duller than almoſt any of the reſt, I found that it had in it Particles enough of an Iron nature to make it a Magnetical Body; and obſerv'd without ſurpriſe, that not only it would ſuffer it ſelf to be taken up by the ſtrongeſt Pole of the Loadſtone, but when that Pole was offer'd within a convenient diſtance, it would readily leap through the Air to faſten it ſelf to it.

I have elſewhere mention'd ſome other Qualities of Diamonds, as beſides their Electrical Vertue, this, That 'tis poſſible that ſome of them may without Fire or Intenſe Heat be brought to ſhine; tho among all that I have Try'd, I found but two that I could ſo make Luminous. *One* of theſe belongs to the King, and is Deſcrib'd at the latter end of our *Hiſtory of Colours*; and the *other* is

a

a very ſmall one of my own; which either was quickly loſt among other Stones of the ſame ſize, or quickly loſt its Faculty of Shining. But, to avoid Repetitions, I ſhall here only add, that ſome few other Obſervations of a more peculiar ſort than thoſe deliver'd in the two foregoing Pentades, may be found in other Writings of ours, to which they ſeem more properly to belong.

CHAP.

CHAP. III.

Many Changes of Colour produc'd by one ſimple Ingredient.

I Know not any way more likely to Convince the generality of Men (who are wont to be much more impreſs'd on by ſenſible Phenomena than Theories, tho ſolidly Founded) how great an Intereſt the variable Texture of Bodies may have in making them appear of differing Colours, than by ſhewing how the addition of a ſingle Ingredient that either is Colourleſs, or at leaſt is not of any of the Colours to be produced, is capable (and that for the moſt part in a trice) by introducing a ſecret change of the Texture to make the

the Body, 'tis put to, appear ſometimes of one Colour, ſometimes of another, according as the parts of the Body wrought upon are diſpos'd to receive ſuch a change as Modify's the incident Beams of Light after the manner requiſite to make them exhibit a Blew, a Green, a Red, or ſome other particular Colour.

Upon this Conſideration I thought of ſeveral Liquors, ſuch as *Aqua fortis*, Oyl (as they call it) of Vitriol, or inſtead of it of Sulphur, *Aqua Regia*, beſides other Saline Liquors that I ſhall not now ſtay to name, becauſe it may here ſuffice to tell you, that amongſt them all I made choice of the Spirit (not that which Chymiſts call the Oyl) of Salt, as that which is very ſimple, and which if it be not too much dephlegm'd, may be had clear and Colourleſs enough. With this Spirit, I proceeded to make the following Experiments upon ſeveral

veral Bodies, whoſe differing Textures made me ſuppoſe they would be fit for my purpoſe. And *tho* I could not, without much diſadvantaging my Deſign, forbear to mention ſome Tryals that may be found elſewhere ſcatter'd among my Writings on other occaſions; *yet* the greateſt part by odds of thoſe laid together in this Chapter, will, I preſume, be found New.

I. Some drops of well Coloured Syrup of Violets being let fall together upon a piece of white Paper, if a third or fourth part ſo much Spirit of Salt be with the tip of one's Finger mix'd with them, the Syrup will preſently become of a Red Colour, uſually ſomewhat inclining to Purple.

II. But if the Liquor to be Acted on, be otherwiſe diſpoſed, 'tis poſſible with Spirit of Salt to turn it from a Blew Colour, not to a Red, but to a Green, as I have ſometimes done by letting fall into

to a deep Solution of Filings of Copper made with an Urinous Spirit, as that of *Sal armoniac*, juſt as many drops of Spirit of Salt as were requiſite and ſufficient to produce the change intended. I ſay *juſt ſo many Drops*, becauſe a very ſmall error either in exceſs or defect, may leave the mixture ſtill Blew, or bring it to be all Colourleſs.

III. Upon a quantity, not exceeding many Drops of good Syrup of Violets, let fall two or three drops of good Spirit of Urine, Harts-horn, or the like, or of Oyl of Tartar *per deliquium*; and when by mixing them well, the Syrup has acquired a fine Green Colour, then by putting to it a little of the Spirit of Salt, and ſtirring it with the tip of your Finger, you may turn the Green Syrup (as in the firſt Experiment you did the Blew) into a Red.

IV. If

IV. If you put a quantity of Red Roſe Leaves well dryed into a Glaſs Vial almoſt full of fair Water, and ſoon after put to them as much Spirit of Salt as will make the Water pretty Sharp, you will quickly ſee both that Liquor and the contain'd Leaves brought to a fine and lovely Red, which Scarlet Colour it will retain for a great while; the like effect Spirit of Salt will have on ſome other Vegetables of a Stiptick or of an Aſtringent Nature.

V. But if by infuſing Brazil in fair Water, you make a Tincture of it, which you may much deepen by droping into it a little Spirit of Harts-horn, or of Urine; if you then put to it a little Spirit of Salt, it will preſently change it from a deeply reddiſh Colour, oftentimes like that of Muskadine, to a Colour far more pale, or rather yellow, like that of the more dilute Sack; ſo that the ſame Spirit acting upon two Vegetable Tinctures

Tinctures differingly diſpos'd, draws out and heightens redneſs in one, and deſtroys it in the other.

VI. If you make an Infuſion of true *Lignum Nephriticum* in Spring Water, it will appear of a deep Colour, like that of Oranges, when you place the Vial between the Window and your Eye, and of a fine deep Blew when you look on it with your Eye placed between it and the Window. But if you ſhake into this Liquor a few drops of Spirit of Salt, the Cæruleous Colour will preſently vaniſh and appear no more, in what light ſoever you look upon the Vial, tho the Liquor will ſtill retain the Orange Colour.

VII. We took common Writing Ink, and having let fall ſeveral Drops of it upon a piece of white Paper, ſo that when it grew dry in the Air, ſome parts of the Ink lay thick and ſome thinner upon the Paper

Paper whereon it did ſpread it ſelf, we put a few Drops of ſtrong Spirit of Salt, ſome on one part of the black'd Paper, and ſome (or perhaps a ſmall Drop) on another, and obſerv'd, as we expected, that in theſe places, where the Spirit had been put, or to which it reach'd, the blackneſs was quite deſtroyed, and ſucceeded by an unpleaſant kind of Colour that ſeem'd for the moſt part to participate of Yellow and Blew, neither of them good in its kind.

VIII. If in Spirit of Salt, you diſſolve Filings of Steel, and ſlowly evaporate the filtrated Solution, it will ſhoot into a kind of Vitriolum Martis that will be Green as well as that which Chymiſts vulgarly make with Oyl of Vitriol. And to add, That on this occaſion, if you take theſe Chryſtals made with Spirit of Salt, and when they are dry, keep them in a Crucible, you will find that even a moderate Fire if duly

apply'd, will make them in a ſhort time exchange their Green Colour for a Red, like that of the finer ſort of Crocus Martis, as indeed this Operation makes them referable to that ſort of Medicines.

IX. We took ſome Mercury precipitated, *per ſe* (that is, by the ſole Action of the Fire, without any ſaline additaments) and tho crude Mercury is not as far as I have tryed, ſoluble in our Engliſh Spirit of Salt; yet this Red Precipitate (which is ſuppos'd to be meer Mercury) with its own Sulphur extraverted, did readily enough diſſolve in that Liquor, and if I very much miſremember not, did not at all impart its own Colour to it: And I alſo found that Red-Lead or *Minium* being boyl'd a while in good Spirit of Salt, the Redneſs did totally diſappear. So that the ſame Agent that produces Redneſs in divers Bodies, did in thoſe two, I have been mentioning, more than

change

change it, ſince it quite aboliſhed it. - Of which alſo, I can give you an eaſier inſtance, by obſerving that the Reddeſt Coral being diſſolv'd in our Menſtruum, the Redneſs vaniſhes, and the Solution appears Colourleſs.

X. Take Filings of Copper, (the ſmalleſt are the fitteſt for this Experiment), and having poured on them good Spirit of Salt till it ſwim, about two fingers breadth over them; keep the Vial in a pretty ſtrong Heat (in a Sand Furnace) till you perceive the Menſtruum has diſſolv'd a competent part of the Metal: Then warily take out the Vial, and holding it between your Eye and the Light, you will perceive the Solution of Copper to be not like that of Steel formerly mentioned, of a Green Colour, but of a dark and troubled one, oftentimes inclining to a deep, but muddy Red.

XI. But if you pour this Solution into a wide-mouth Glaſs, and

let it ſtand for a competent time, (which ſometimes amounts but to a few hours, and ſometimes to very many) the expos'd Liquor will appear of a Green, much finer than that of the Chryſtals of Mars.

XII. Take filtrated and limpid Solution of Silver, or of Mercury made in Aqua fortis, and drop upon it ſome Spirit of Salt, by which you ſhall find the clear Liquor turn'd white as Milk, which after a while will let fall a precipitate of the ſame Colour.

XIII. And if inſtead of a Solution of Silver or Quick-ſilver, you take a Red Solution or Tincture of Benjamin, or of the Reſinous part of Jallap Root, or you'le alſo have upon the Affuſion of Spirit of Salt, a white Liquor and a Precipitate of the ſame Colour.

XIV. Being deſirous to produce two differing Colours at once by the ſame

ſame Affuſion of Spirit of Salt, I infuſed ſome dryed red Roſe leaves in fair Water, till it had acquired a deep Colour from them. To this Infuſion, pour'd off warily, that it might be clear, I added a conſiderable proportion of the ſweet Liquor, made by digeſting Spirit of Vinegar upon red Lead, by which I knew 'twould be turn'd of a Blewiſh Green. Upon this almoſt opacous Liquor, I pour'd Spirit of Salt, which as I expected, precipitated the Lead that had been diſſolv'd in the ſweet Liquor, into a very white Powder, and gave the remaining Liquor, well impregnated with particles of the Roſe Leaves, a very fine and durable Scarlet Colour. To which Experiment I ſhall add on this occaſion, that if it had been well made, you may barely by ſhaking very well together and confounding the White Powder with the Red Liquor, make a Carnation Colour, which (when 'tis made as it

ſhould be) appear'd very fine and lovely whilſt it laſted, for in no long time the two Subſtances that compos'd it, would by degrees ſeparate, and re-appear each of them in its former place and Colour.

XV. We took ſome Spirit of Salt, that having lain long upon Fylings of Copper, had loſt the muddy Tincture it had firſt acquired by being almoſt boil'd upon them. This Liquor, I ſay, that look'd like common Water, we pour'd into a ſmall, but wide-mouth'd Chriſtal-Glaſs, about half an hour after 8 in the Morning, and leaving it in a Window, it appear'd after 40 Minutes to have there acquir'd a Colour, much like that of a German Amethiſt, and ſeem'd to have no tendency to Greenneſs. But being detain'd by the viſit of a *Virtuoſo* till eleven a Clock, I could not ſee what happen'd in the mean time: But then as he was going away, I

invited him to ſee the Liquor, which he (not knowing what it was) told me it look'd of a Graſs-green Colour, wherein tho I were not altogether of his mind, yet in a ſhort time after, it did to me alſo appear of a lovely Green; in its paſſage to which it had in all been expos'd about 3 hours and a half

XVI. Precipitate a ſtrong Solution of Sublimate, (made in fair Water) with a ſ. q. (and no more) of Oyl of Tartar *per deliquium*. Put the Liquor and Powder into a Filter of Cap-paper, and when the Water is run thorow, there will remain in the Filter the Precipitate, which is to be ſlowly and well dry'd. Then take it out of the Filter, in the form of a groſs Powder, and having put it into a clear Glaſs, let fall on it warily ſome Drops of pretty ſtrong Spirit of Salt, and (if the Experiment ſucceeds with you as it did with me) during the Conflict that will

be made, the little Lumps of the Precipitate will loſe all their former Brick-duſt Colour, and turn White, tho afterwards they will appear diſſolv'd into a tranſparent Liquor, wherein the Orange Colour is quite aboliſh'd.

XVII. Having calcin'd Copper without any Additament, ſave Fire and Water (by the way we elſewhere mention) we took an Arbitrary quantity of it, and having pour'd on it about 3 or 4 times the quantity of good Spirit of Salt, we obtain'd (what we look'd for) both a Muddy, but manifeſtly *Reddiſh Liquor*, and (ſomewhat to the ſurprize of the Perſons I had a mind to ſatisfy) a white Powder, whoſe *quantity* bore a conſiderable proportion to the Part that was diſſolv'd, (but whoſe *Qualities* belong not to this place) In which part its ſelf, (to add that upon the by) by the affuſion of common Water, and the action of the Air, we afterwards produc'd more than

one

one change of Colour.

XVIII. We ſometimes for Curioſity ſake took a quantity, not exceeding a ſpoonful, of the dark brown or ſomewhat reddiſh Solution of ♀, mention'd in the foregoing Experiment, and having put it into a cylindrical Vial, that the change of Colour may appear the better, we pour'd on it 2 or 3 Spoonfuls of totally ardent vinous Spirit, and giving the Glaſs a ſhake to mingle them, we preſently had (as ſoon as the mixtute became clear) a lovely green Liquor, which when 'twas well ſetled, was very fair, and lookt almoſt as if it were a liquid Emerald.

XIX. We took ſome green Taffatee Ribband, and having moiſten'd one part of it, that was not great, twice or thrice with good Spirit of Salt, we ſuffer'd it to dry of its ſelf; which it did in a ſhort time, and then we found as we expected, that the wetted part was

no

no longer of a Green, but chang'd to a Blew Colour. But the ſame Spirit, (to add that upon the by) preſently turn'd that part of a piece of black Ribband, upon which we put 2 or 3 Drops of it to a Colour not unlike that which they call *Fueille Morte*, or, a fading Leaf.

XX. 'Tis uſual in Paper-ſhops, and in divers other places, to meet with Pamphlets and other thin Books that are covered with Papers that look ſometimes of a Greeniſh Blew Colour, bordering upon Purple, and ſometimes upon that of Violets. Some of the deeper colour'd Papers of this ſort, I have ſeveral times to gratify ſome curious Perſons, eſpecially of the Sex, held in my left hand, and with the other lightly and nimbly toucht them here and there with the end of a feather (cut off from the reſt of the Quill) dipt in Spirit of Salt, which almoſt in the twinkling of an Eye, dy'd the

the toucht parts of the Paper with a Lovely Red, that would ſometimes continue very Vivid for a good while, and be manifeſt at the end of divers Weeks, if not Months. And if inſtead of the forementioned Quil, I took into my right hand (a Bruſh, or) ſomewhat that was fit to ſprinkle with, and having dipt it in the Saline Spirit, made many drops at once fall upon the Paper, 'twas pleaſant enough to behold how ſuddenly and prettily it would be Speckled.

XXI. VVe took Antimony well powder'd, and pour'd on it 3 or 4 times its weight of good Spirit of Salt; we caus'd it to be boil'd in this Liquor, (and that in a Glaſs Veſſel) wherein a part of it was diſſolv'd, and taken up into the *Menſtruum*; where the Antimony quite loſt its blackneſs. And this thus impregnated Spirit of Salt, being dropt into fair VVater, the black Mineral ſubſided immediately

ly, in the form of a very white Powder or Precipitate.

To theſe I might add other changes of Colours, that I have made, by the help of Spirit of Salt. But theſe being not of ſo quick and eaſy Tryal, (eſpecially becauſe ſome of them require skill in Chymiſtry) I thought it not fit to annex them; ſuppoſing that thoſe already deliver'd, amounting to above four Pentades, may ſuffice for the purpoſe declar'd at the begining of this Paper. And alſo to afford us this Reflection, That it may not be amiſs, if Phyſicians, Chymiſts, and others that are wont to compound Drugs, or other Ingredients; would be leſs forward than they uſually are, to mingle, not to ſay to jumble, ſeveral of them together, either unneceſſary, or without due regard to the friendly and incongruous Qualities (in reference to one another) that the ſeparate Ingredients may have. For moſt of us

are

are but too lyable to be miſtaken, when we preſume before-hand, what changes the Coalition, or other Aſſociations of differing Bodies may produce; eſpecially if they be either Saline, or plentifully partakers of a Saline Nature; Since Experience frequently ſhews, that by the *Action* and *Reaction* that are conſequent upon untry'd ways of Compoſition, there Emerge in the mixture new Conſiſtences and other Qualities or Accidents, that were not look'd for, when the Ingredients 'tis compounded of, were put together. And tho it may ſometimes happen luckily enough, that theſe Emergent Qualities, whether of Drugs, or other Comparatively ſimple Bodies, may prove advantagious; yet this may well be look'd upon but as a lucky *chance*; and hinders not, but that one may juſtly fear that *ordinarily* the newly produc'd quality of a Medicine, may prove to be either *worſe* than was

ex-

expected, or at leaſt *other* than was deſign'd, and conſequently leſs fit for the Phyſicians or the Artiſts determinate purpoſe.

CHAP. IV.

An Advertiſement touching thoſe Paſſages that in this Book relate to the Art of Medicine.

THE favourable Reception the Publick was pleas'd to give two Editions ſet forth in one Year of *The Uſefulneſs of Experimental Philoſophy*, having Encourag'd the Stationer to Solicite me for a new Impreſſion, I was on the ſame ground invited to think of making additions to divers parts

parts of that Treatiſe; but afterwards obſerving that notwithſtanding the Thanks and Acknowledgments I had the good fortune to receive from ſeveral Phyſicians (ſome of them of great Reputation, and perhaps by that only known to me) yet others were not well pleas'd that a Perſon not of their Profeſſion ſhould offer to meddle with it, tho with a deſign of advancing it: I, whoſe condition exempted me from taking upon me their Calling, and who conſequently muſt want many opportunities that others injoy'd of making Obſervations about the Phænomena of Diſeaſes and of Medicines, ſuffer'd my ſelf without much violence to be diverted to other Studies more ſuitable to my Inclinations, as well as to my Condition, and accordingly I laid aſide the Papers I had Written in reference to the Phyſicians Art, nor were it eaſy, or perhaps poſſible for me to retrieve them, after they

they have lain ſo many Years diſpers'd and neglected, by which means perchance divers of them have been loſt.

But all this could not hinder me from being preſs'd to retrieve and communicate theſe ſcatter'd and duſty Papers by the Secretary of the Royal Society Mr. *H. Oldenburgh*: For as this Gentleman has been almoſt every where wonderfully ſolicitous to preſerve every thing from being loſt, that may any way contribute to increaſe the ſtock of uſeful knowledg. So having got notice of theſe Papers, and a ſight of ſome of them, his partiality for me made him much over-value them, and perſwaded him that a Collection of them as incoherent and unfiniſht as they were, might be of ſome uſe to the Phyſicians Art. And this ſeem'd the more hopeful, becauſe Natural Philoſophy being a Science of far greater Extent than Phyſick, and ſupplying it, with many of its Princi-

Principles and Theories; 'tis very poſſible that Naturaliſts, tho not Profeſt Phyſicians, may propoſe ſome ſuch comprehenſive Notions and Methods, as may awaken and inlarge the minds of them that are ſo, and at leaſt afford ſome uſeful hints to conſidering and ingenious Men. And in effect divers Phyſicians, as well as many Patients, have been pleas'd to declare (ſome in Print, and ſome other ways) that ſometimes they found not uſeleſs aſſiſtances from ſome of thoſe Papers, wherein I occaſionally touch'd on Medicinal things. Such Motives as theſe made Mr. *Oldenburg* ſo earneſt to procure the ſcatter'd Fragments, that I might have yet remaining, about Medicinal Affairs, that tho for the Reaſons mention'd above, I could not think it fit to make a Collection of Papers ſo unlike in their Subjects, ſo diſproportionate in their Bulk, and ſo unfiniſh'd and imperfect on divers ſcores;

Yet thus far I was content to comply with his desires, that when these Trifles came to hand, I would now and then insert them among my *Experimenta & Observationes Physicæ.* (Medicine being a *Part*, or an *Application* of Natural Philosophy) especially if there were any great affinity between the Paper I lighted on, and the Subject I was then treating of: Knowing well that Mr. *Oldenburg*, and perhaps some others too, had rather I should *impart* them at all adventures, than *suppress* what they judg'd might be useful; and that 'twas better to run the hazard of having them *slighted*, than *lost*.

This Advertisement I thought fit to give in this place, once for all, that when hereafter there shall occur any thing among these *Experimenta & Observationes Physica*, that directly relates to the Physician's Art, you may not think it strange, remembring upon what account I ventur'd to meddle with things

things of that Nature, and alſo that you may readily underſtand what I mean, when you meet with any Particulars delivered, as *Thoughts* or *Deſiderata* or *Wiſhes*, tending to, or aiming at the Improvement of Medicine; which how ſlight or ſuperfluous ſoever they may be to Experienc'd Maſters, to whom I did not preſume to recommend them, I thought might probably be ſerviceable to a very Ingenious, but yet Young Cultivator of that noble Art, (whoſe Name, I conceal'd after the way of the Curious of *Germany* under that of *Trallianus*,) for whoſe uſe they were intended.

The I. PENTADE.

EXPERIMENT I.

A very Tall and well Set Gentleman, Aged about 24 years, by a Fall from his Horſe, had

his Skull broken in ſeveral places, and being a Perſon of good Eſtate, had ſeveral Chirurgeons to attend him in the courſe of his Sickneſs; during which he was divers times Trepan'd, and had ſeveral pieces of his Skull taken off, which left great Chaſms (that I have ſeen and felt) between the remaining Parts. Within about three days after his Fall, this Knight (for ſo he now is) was taken with a Dead Palſey on his Right Side, which did not equally affect his Arm and his Leg: The uſe of the latter being ſomtimes ſuddenly Reſtor'd to him in ſome meaſure, and (tho ſeldom) after a while almoſt as ſuddenly Loſt: But his Arm and Head were conſtantly Paralytical, being wholly depriv'd of Motion; and having ſo little Senſe, that it would ſometimes lye under his Body without his Feeling it. But if his Hand were prick't with a Pin, he could take notice of it. This Palſey continu'd

tinu'd during almoſt the whole time of the Cure, which laſted 23 or 24 Weeks. And when the Chirurgeons were going to cloſe up his Head, as having no more to do; one of them who was an Ingenious Man, and Tenant to this Gentleman, oppos'd all the reſt, alledging, that, if they did no more, the Gentleman would lead an Uſeleſs and very Melancholy Life; and that he was confident, the Palſey was ſome way or other occaſion'd by the Fall, which had left ſomthing in the Head that they had not yet diſcover'd. And the Knight himſelf agreeing to this Man's motion, his Head was further laid open; and at length, under a piece of proud Fleſh, they found, with much ado, a Splinter, or rather Flake, of a Bone, that bore hard upon the *dura mater*, and was not pull'd out without a great Hemorrhage, and ſuch a ſtretch of the Parts, as made the Patient think his Brain it ſelf

was tearing out. But this Miſchief was ſoon Remedy'd, and his Hurts ſecurely Heal'd up; and he is now a Strong Healthy Man, and finds no Inconvenience by having ſo broad and various a *Callus* inſtead of the Skull; ſave that he is a little obnoxious to take Cold in his Head. But the memorable Circumſtances, for whoſe ſake I mention this Narrative, were theſe: When I ask'd him how big the Bone was, that was laſt taken out? He told me, that it was leſs than half the Nail of one of his Fingers (not his Thumb) and that it was almoſt as thin, being in ſize and ſhape like the Scale of a Fiſh: But that it did not in his Head lye flat, but bore hard upon the *dura mater*. When I ask'd him how long after it was taken out, he began to feel ſome Relief, as to his Paralytic Diſtemper? He reply'd, That in leſs than five hours he found himſelf, to his great joy,

joy, able to move his little Finger; and (tho this happen'd in the Evening) he was the next morning able to move all his Fingers, and within 2 or 3 days after to lift up his Arm: By which it ſeem'd manifeſt, that ſo little a Body as the Splinter lately mention'd, produc'd in ſo robuſt a Perſon, a Palſey of the whole ſide it lay on. For when I particularly ask't him, Whether, after the taking away of the proud Fleſh that encompaſs'd the little Bone, he did not find, if he found none before, ſome Relief as to his Palſey? He anſwer'd, that he found none at all, till the Bone had been pull'd out, which was not till a good while after the Chirurgeon had been by degrees eating off the proud Fleſh that grew about it. But there was in this caſe another *Phœnomenon* that I thought little leſs conſiderable than the former. For, remembring the important controverſie, that is agitated a-

mong modern Phyſicians and Anatomiſts, about Nutrition by the Nerves, and having thereupon ask'd this Knight, whether he did not find an Atrophy in the Limbs of his Body that were affected? He told me, that when he began to be Paralytic on that ſide, it by degrees much waſted, and the Paralytic Leg was very much Extenuated: But the Arm and Hand much more, ſeeming nothing but a Syſtem of Bones, with the Skin paſted on them. And when I further ask'd, if upon the removal of the Bony Splinter abovementioned, the Atrophy of the Parts did not alſo begin to leſſen; he anſwered affirmatively, and told me, that in no very long time his Leg and Arm recover'd their wonted Dimenſions; and in effect I (ſome days ſince) ſaw the reſtor'd Arm well plump'd up with muſculous Fleſh, tho the Weather were exceeding Cold. And he further told me, that he found

no

no difference between the Limbs that had been Paralytic, and the others, except that they would grow ſooner and more ſenſibly cold in Sharp or Froſty Weather.

This Gentleman anſwer'd me, to add that upon the by, that, during the courſe of his Cure, he was very frequently (almoſt every ſecond day) let Blood; that he wanted not Appetite to his Meat; that for the moſt part he ſlept indifferent well; and, which was more remarkable, upon ſo great a Hurt of the Head he did not Vomit, nor had afterwards any Convulſions.

II. Among other Inſtances I have met with, that ſhew the great Power which ſudden Paſſions of the mind may have upon the Body, I remember that a Woman of middle Age, complain'd ſadly to me of the miſchief, a Fright had done her; for ſhe related to me, that having taken along with her to a Meadow by a River=

River-ſide, a little Boy that ſhe was dotingly fond of, whilſt ſhe was buſie about the work ſhe came thither for, the Child ſtole away from her, and went along the Bank, to delight himſelf with the View of the Stream; but being heedleſs, it ſeems by Circumſtances, that he ſet his Foot upon ſome piece of Ground that the Water had made hollow; upon which account, the Earth failing under the weight of the Boy's body preſſing it, that, and he fell together into the River: In the mean time the poor Mother caſually miſſing her Child, haſtily caſt her Eyes towards the brink of the River, and not being able to ſee him there, ſhe preſently concluded him to be Drown'd, and was ſtruck with ſo much horrour upon the ſudden accident that tore from her a favorite Son, that among other miſchiefs, ſhe fell into a Dead Palſy of her right Arm and Hand, which continu'd with her

her in ſpight of what ſhe had done to remove it, till the time ſhe complain'd of it to me, who had not opportunity to know what became of her afterwards.

III. On the other ſide, to ſhow that Violent Paſſions, and even Frights may ſometimes, tho very ſeldom, do good, as well as harm; I ſhall here add a Relation that was circumſtantially made me by the learned Perſon himſelf, to whom the Accident happen'd. I familiarly knew a Gentleman that liv'd to be an Eminent *Virtuoſo*, and to oblige many by his uſeful Writings, who when he was a Youth, fell into a violent and obſtinate *Sciatica*, which continu'd with him ſo long, that it left him little hope of Recovery; but the Devotion of this Young man's Friends invited them to make him be carry'd, ſince he could not go, to Church upon Sundays; and there it happen'd, that the Town being a Frontier Gar-

Garriſon, the Guards were ſo negligent, that there was occaſion given to a very hot Alarum, that the Enemy was got into the Town, and was advancing towards the Church to Maſſacre all that were in it. This ſo amaz'd and terrifi'd the People, that in very great and diſorderly haſt, they all ran out of the Church, and left my Relator in his Pew upon a Seat that they plac'd him, and whence he could not remove without help: But he being no leſs frighted than the reſt, as they forgot him, he forgot his Diſeaſe, and made a ſhift to hamper off the Pew, and follow thoſe that fled; but it quickly appearing, that the Alarum had been a falſe one, his Friends began to think in what a condition they had left him, and haſten'd back to help him out of the Pew, which whilſt they were going to do, they, to their great ſurpriſe found him in the way upon his feet, and walking

ing as freely as other Men. And when he told me this Story, he was above forty years Elder than when he was thus ſtrangely reſcu'd, and in all that time, never had one Fit of the *Sciatica.*

ADVERTISEMENT.

'Tis eaſy to be obſerv'd, that of the two kinds into which Chymiſts may be conveniently enough ſorted; the Number is greater of thoſe that are not Profeſt Phyſicians, than of thoſe that are: And yet ſeveral of the former ſort are led by their more free Curioſity, or their particular Deſignes, to allow a large ſcope to their Tryals; and ſo in their Experiments upon various Bodies, to operate upon ſome of thoſe that may be reduc'd (either directly, or by fit applications) to the *Materia Medica*, and afford uncommon Preparations: Which tho deſign'd for other purpoſes, may by a skilful Phy-

Phyſician, with a light Variation, and perhaps without any, be made to afford good Medicines: And therefore I think it may be no inconſiderable ſervice to the Publick, if by the leave and aſſiſtance of the Authors, divers Chymical Experiments that are not directly uſeful to their immediate purpoſe, were not, (as is uſual) thrown away, but put into the hands of ſome Sagacious Phyſician.

Upon theſe grounds, I thought my ſelf little leſs than oblig'd, to ſet apart now and then an Experiment that contain'd ſome uncommon Preparation, which ſeem'd applicable to Medicine; and to try whether, tho, being in the Country or in ſome other inconvenient Circumſtances, I had not opportunity to prove it my ſelf, the notice given of it, might not happen to be of uſe to a skilful Phyſician.

I ſhall therefore partly in this Chapter, and partly (if God permit) in ſome following Chapters and other Writings, tender to ſuch a one, ſome few of the Experiments of this *ſort*, that I lately lighted on among my *Adverſaria*, and that ſeem'd not uncapable to be made of ſome ſervice to the Phyſician's Art.

Of the good and bad effects of theſe, I ſhall be glad to be inform'd, that they may be either us'd more freely and improv'd, or corrected and quite laid aſide; and I deſire that this ſhort Preamble may ſerve for a general one to all the other deſign'd Chymical Medicins that I ſhall venture to propoſe hereafter.

A Deſign'd Chymical Medicine.

IV. I know how much Men are prejudic'd in ſome whole Countries, againſt Vomitive Medicines: and I remember we have had here in *London* a Phyſician of great Fame and Practice, that would turn over a Patient to another Doctor, if the Caſe were ſuch that the Patient would needs make uſe of Emeticks. And I readily acknowledg that they are edg'd Tools, that require a Skilful Hand, to imploy them without danger of doing more harm than good: But ſince Experience ſhews that where the Patient can bear them, and the Diſeaſe requires them, they act more ſpeedily and effectually than other evacuating Medicines: And ſince the generality of our Phyſicians, not excepting ſome that are juſtly reputed

puted very Cautious, do not ſcruple frequently to make uſe of the Infuſion of *Crocus Metallorum*, tho it do not ſeldom prove a Remedy harſh enough; I ſhall venture in compliance with ſome ingenious Phyſicians, and others that have often made uſe of a Medicine, that goes under the name of my Emetick Drops, to communicate the Preparation of them; without preſſing the uſe any otherwiſe than by confeſſing that divers Practitioners of Phyſick of differing Sentiments, agree in aſſuring me, that they have not yet found any Emetick to work ſo effectually, nor with more eaſe and ſafety, than this Liquor; which ſome of them prefer by much to other Antimonial Vomits; and eſpecially to the Infuſion of *Crocus Metallorum*.

In preparing my Vomitive Liquor, I have not always imploy'd the ſame proportion of the Ingredients 'tis made of, nor did I find

it neceſſary to be nice in that matter. But the proportion I ſomewhat prefer, is to take two Parts of well choſen and finely powder'd Antimony, and on theſe to pour three Parts of the Menſtruum, *viz.* Sp. ; which ought to be rather moderately ſtrong, than too much rectified. Theſe are to be diſtill'd together in a Glaſs Retort fitted with a Receiver not very ſmall, till there come over a great part of the Menſtruum, which will uſually towards the cloſe be accompany'd with Red *Flores*, (ſometimes copious enough) which being ſeparated by filtration through Cap-paper, the clear tranſmitted Liquor is to be put into a Glaſs, not newly waſh'd, but dry on the inſide, and to be kept cloſe ſtopt from all Intercourſe with the Air.

The Doſe is uſually to a Man or Woman, eſpecially at the firſt time, from 4 or 5, to 7 or 8 Drops: But I know an Ingenious Phyſician

that

that gives to 10 or 12, or a few more Drops, if the Caſe be urgent; and by that means he told me, that with a ſmall Button-Bottle, that I chanc'd to give him a little before, he did in 2 or 3 hours reſcue three Gentlemen, that by a bad Surfet with very bad Circumſtances, were ſuddenly brought into great danger of ſpeedy Death, and carry'd to a neighbouring Tavern, as being too ill to be carry'd home.

The Vehicle may be a Spoonful or two of Wine, or Black-Cherry Water, or (which divers Perſons chuſe rather) of Spring-Water, Drinking up the Liquor immediately after, becauſe there will ſome Precipitation be made; and then taking 2 or 3 Spoonfuls of the ſame Vehicle to waſh it down. It uſually begins to work early, and does it without cauſing near ſo much ſtraining as vulgar Emeticks, and yet makes Copious Evacuations; and ſometimes ſo

Eradicative of the Morbifick matter, that the Phyſician lately mention'd, who Cur'd the three Gentlemen, having a poor Patient who had Conflicted for above three Years with an Ague in ſeveral Types, but moſt commonly Quartanary, perfectly Cur'd him with two Doſes of theſe Drops, and a Julap made chiefly of the Diſtill'd Water of a common Vitriolick Mineral. And this Cure ſeem'd therefore to me, when the Phyſician gave me an account of the Drops he had from me, the more conſiderable, becauſe the Patient had made uſe of great Variety of Remedies; and particularly he devour'd great ſtore of the Jeſuits Bark, or *Cortex Peruvianus*, (perhaps becauſe it was not well Condition'd, or skilfully Adminiſter'd) which ſometimes alter'd the Type of his Ague, turning it to a ſingle or a double Tertian, and ſometimes kept off the Fits for a while, when 'twas

'twas a Quartane, but never Cur'd him quite; and left him in a deplorable eſtate, wherein the Emetick Drops found him.

Tho I ſent this Medicine to ſeveral Patients, in whom, thanks be to God, it ſucceeded more than ordinarily well, yet I durſt not venture to give it to Children, or to very young Perſons; but having gratifi'd an Ingenious Surgeon of good Practice, with a ſtock of it, the Tryals he made upon divers Perſons, with great Succeſs on other Patients, imbolden'd him to give it to Boys and Girls, and afterwards even to ſeveral Children, whereof he gave me a good Account, only he diſcreetly took care to proportion his Doſes to the Age and Strength of his Patients, and not to give the whole Doſe at once, but divide it into 2 or 3 parts, that if the firſt ſhould work within half an hour or leſs, the ſecond ſhould not be given, or leſſen'd in

quantity. And if neither the ſecond did work within about an hour, he added the third. And by this Cautious Method, he aſſur'd me that he had ſuddenly reliev'd ſeveral Children in bad Caſes, and found not any miſchief or danger enſue upon the adminiſtration of it. But Children being tender Creatures, this is to be further and cautiouſly try'd.

POSTSCRIPT.

Having had occaſion to keep by me ſome Vials furniſh'd with the Emetick Drops, longer than I thought I ſhould need to do ſo: I obſerv'd that in tract of time, there began to ſubſide a white Powder, wherein a good part of the Emetick faculty of the Medicine may be ſuppos'd to reſide; therefore 'twill be beſt either to imploy the Liquor in no long time after 'tis made, or if one has not leiſure or conveniency to do ſo, to

ſhake

ſhake the Vial well (that the Powder may be rais'd and we'l diſpers'd through it) juſt before it be adminiſter'd.

A Deſign'd Chymical Medicine.

There are many that having a high Eſteem for Chalybeate Waters, ſuch as thoſe of the Spaw and Tunbridg, which yet in many p'aces are not to be had at all, and in few to be had well condition'd, are very Solicitous to find Succedaneums to them. To gratify ſome Ingenious Perſons of this ſort (and improve a caſual hint taken from a Book of a ſomewhat like Preparation propo inded for another purpoſe) I remember, I Employ'd a way of Æmulating ſuch Waters that anſwer'd the outward Phænomena of Colour and Taſte, and ſeem by the paucity and harmleſneſs of their In-

gredients like to be innocent Medicines; I had no opportunity to make tryal of them in Phyſick, but finding that ſome Inquiſitive Cultivaters of that Art, valu'd them more than I did, I committed the Experiment to Paper, and now ſuffer it to come abroad, that it may be try'd by Phyſicians, and either rejected or made uſe of, as ſucceſs ſhall direct. The Experiment as I made it, was this.

We took one part of very good Fylings of ♂; and ten parts of good Diſtill'd Vinegar. Theſe we put into a Bolt-head, and ſtop'd it well, and then in a mild heat of Sand we digeſted them for about two days, and afterwards augmented the Heat till the Liquor appear'd of a deep Orange Colour, but yet tranſparent. Part of this Tincture we pour'd off, and kept well ſtop'd by its ſelf, becauſe tho by a longer digeſtion and a greater heat, we obtain'd a very red Tincture, yet we did not ſo much

value it, becauſe when the Menſtruum is over Impregnated, the Metal uſually precipitates, and the fine Colour is deſtroy'd. Of the firſt reſerv'd Tincture, we let fall 4 Drops into ℥VIIIſs, (8 ℥ſs) of clear common Water, whoſe Colour was not thereby ſenſibly alter'd; and the Vial containing this Mixture being well ſhaken, that the Tincture might diffuſe it ſelf the more thorowly, we kept it carefully ſtop'd for uſe, as being our Factitious or Counterfeit Spaw. A Spoonful or ſomewhat more of this, with about a quarter of a Grain, or leſs, of good freſh Powder of Gauls, would preſently afford a Purpliſh Tincture, like that of Natural Springs impregnated with Mars, ſuch as the Water of the *German* Spaw, or of *Tunbridg* in *Kent*; if ones Mouth were Waſh'd with it, 'twas found to have like thoſe Natural Chalybeat Waters, a manifeſtly ferruginous taſt. N. B. Theſe Artificial

tificial *Acidulæ* are to be Administer'd in no long time after they are made; for Experience has inform'd me, that (at leaſt ſometimes) when I kept them too long, within not many days after they were made, they would loſe much, if not moſt of their Briskneſs and Force. And I ſometimes perceive that there would ſubſide to the bottom a certain red or reddiſh Subſtance, as it were Oker, which was a token of the Degeneracy of the Liquor; and ſome ſuch thing I have obſerv'd in ſome Natural Chalybeat Waters too long or negligently kept. But our *Acidulæ* may be ſo ſoon and ſo cheaply made freſhly, that the above mention'd Inconveniency will ſcarce to the Skilful ſeem conſiderable.

The II. PENTADE.

EXPERIMENT II.

Becauſe it may be on ſome occaſions of uſe to a Phyſician, to have ways of Diſcovering the Adulterateneſs of Bezoar Stone, which for its dearneſs is often Counterfeited, and not eaſily diſcern'd to be ſo by the common ways of Exploring, which uſe to be uncertain enough; it may not be amiſs to Communicate a new way of Tryal, which 'tis unlike that Impoſtors have dream'd of, or if they ſhould know it, can eaſily elude. And this I am the rather willing to do, becauſe the propos'd way may afford an uſeful hint to the Sagacious Inquirers into the Nature, and ſome of the Preparations that may be made, of the Bezoar Stone; which tho it be a Drug too much Magnify'd by ſome Phyſicians, eſpecially thoſe

thoſe that depend on it, againſt the true Plague; yet a Phyſician of great Experience, and rather a ſevere, than any ways a partial Judg of it, allows it to be an excellent Remedy even in Malignant and ill-condition'd Fevers, at leaſt if they be not truly Peſtilential. One of the ways I imploy'd, in treating the Bezoar Stone, may be eaſily gather'd from the enſuing Tranſcript of one of my regiſter'd Experiments.

We took 40 or 50 Grains of choice Oriental Bezoar Stone reduc'd to Powder, and in a Bolt-glaſs pour'd on it 3VI of good Spirit of Niter, as well to try whether this Liquor would prove a fit Menſtruum for this Stone, as we found it to be for the *Calculus Humanus*, as for other purpoſes. And tho this Affuſion being purpoſely made in the Cold, the Liquor did not ſeem at firſt to work on the Stone; yet ſoon after it fell violently upon it, and diſſolv'd the greater

greater part of it, not without noiſe and a Notable Effervescence. The Solution was almoſt Red, and the Glaſs being put in a digeſtive Furnace, the whole Powder was not only diſſolv'd, but being left a night or two in a North Window, it afforded divers Saline Concretions, much larger than could well have been expected from ſo ſmall a quantity of matter; and theſe Cryſtals, whilſt they were yet in the Glaſs, might eaſily be taken for Cryſtals of Salt-peter, ſo great was their reſemblance.

To manifeſt how much the faculties of looſening and binding, are relative things, and depend upon the Diſpoſition of the Body to be wrought upon, and ſo upon the Congruity betwixt the Agent, and the Patient, I know an Ingenious Gentlewoman, on whom Cinnamon, which generally is a conſiderable Aſtringent and Stomachick Medicine, has a quite contrary Operation, and that in a ſtrange

ſtrange degree, inſomuch that having found by 2 or 3 accidental Tryals, that a very little Cinnamon ſeem'd to diſorder her Stomach and prove Laxative, ſhe reſolv'd once to ſatisfy her ſelf, whether thoſe Diſcompoſures came by Chance, or no; and having ſtrew'd ſome powder'd Cinnamon upon a Toſt, ſhe was going to put into her Ale, upon eating the Toſt ſhe was copiouſly Purg'd for two days together, and that with ſuch violence, that it put her into Convulſion Fits, and a kind of Spaſmus Cynicus, which ſhe could never be perfectly freed from, being troubled with from time to time for 3 Years, as was the other day averr'd to me, and divers others that know her, by her Husband who is himſelf a Learned Man and a profeſt Phyſician.

A proſperous Phyſician, to whom I had recommended ſome things relating to his Profeſſion whilſt he practis'd it with Succeſs

in

in the Capital City of *Ireland*, where at that time there rag'd a new and violent Fever, whereof Multitudes Dy'd, very few Patients Recovering of it, happily lighted on a Method that prov'd, through God's Bleſſing, very Proſperous. This Doctor returning into *Ireland* ſometimes before, having been deſir'd by me to ſend me an account of ſome things relating to Natural Philoſophy and Phyſick that I nam'd to him, wrought to me in anſwer to ſome of my Enquiries a Letter, out of which I thought fit to make this Extract, becauſe I know not but that it may give good hints towards the Cure of ſome other ill-condition'd Fevers.

Dublin,

Dublin, Feb. 27. 1682.

I Have imployed *Ens Veneris* for the removal of a *Subſultus Tendinum*, in a Perſon dangerouſly Sick of a *Febris Petechialis* (a Diſeaſe fatal to very many here for theſe 12 or 14 Months) and found that it anſwer'd my hopes in 3 or 4 Hours after I gave it in Conſerve of Borrage Flowers.

I have, ſince I came from *England*, thought of a Method of Curing the aforeſaid Fever, which has not once fail'd me, tho I made of it for 16 or 18 ſeveral Perſons, many of which would certainly Dye, if treated after the uſual manner in this caſe. If I ſhould tell you from what Obſervations and Reaſonings I came to alter the Method of Cure, I ſhould be very tedious. I ſhall therefore at preſent wave that, and proceed to tell you, That when firſt I come

to

to any Sick of this Diſeaſe, if I find Coſtive (as generally they are) I preſcribe a Gliſter, and after that an Epiſplaſtick Plaiſter 6 or 7 Inches broad, and 8 or 9 Inches Long, to be apply'd between the Shoulders; the Bliſter being well rais'd, I order to be Dreſs'd carefully, ſtripping off the Cuticula. This continues running till the Fever is gone off; which is moſt commonly in 10 or 12 days, if they have not kept up too long with it, and then we cannot certainly foretel the time of the Fever's declination; for the whole time till the going off of the Fever, I Preſcribe Emulſions of Aq. Aronis, Card. Bened. Citrij totius & Syr. Granatorum cum Aceto; I allow of Orange and Butter-milk Poſſets, of roaſted Apples, Flummery, or any other light and cooling thing they call for.

By this Method I keep the Genus Nervoſum and Brain from being Affected, and conſequently

ſecure my Patients; for as many as I have ever known of them Dye, that were troubled with this Diſeaſe, Dy d of a diſorder of thoſe Parts. I do not defer the Bliſtering Plaiſters, as others do, till I find my Patients Delirous, Lethargick, Convulſive, or otherwiſe affected in their Heads and Nerves, finding by the Experience of others that then they moſt commonly prove ineffectual, becauſe of ſome Morbifick Matters being too deeply lodg'd in theſe parts. I do not preſcribe, except upon ſome extraordinary occaſions, any Volatile Salts or Spirits, or any thing too apt to quicken the already over-brisk Circulation of the Blood, having Experimentally Learn'd that by theſe often us'd, the Brain and Nerves become ſooner than ordinary affected, for as much as they deeply inſinuate themſelves, and drive with them ſome Morbifick Matter into the Brain and Nerves. I find Bleeding bad,

bad, being generally Fatal. If I doubt of the Recovery of any of my Patients Sick of this Diſeaſe, 'tis only when I find that they have been let Blood, or lain for 8 or 9 days before I come to them; tho I have brought through it, even Perſons in thoſe Circumſtances.

A Deſign'd Chymical Medicine.

I ſhall not, becauſe I need not, Diſcourſe of the Medicinal Vertues of Steel in a City where many Learned Phyſicians do ſo much eſteem and imploy Chalybeate Medicines as they do in *London*, and therefore I ſhall content my ſelf at this time to offer you a couple of Preparations of Steel that poſſibly you have not met with or thought of.

1. Conſidering that moſt of the ways made uſe of by Chymiſts to

prepare Steel, tend by dividing it into very Minute parts, to make it more lyable to be wrought on by the Liquors of the Stomach, and ſome other parts of the Body, and that the generality of theſe Chalybeate Preparations are wont to be made only with Acids, whether manifeſt, as Oyl of Vitriol, Spirit of Vinegar, *&c.* or Occult, as Brimſtone, which tho inſipid in its Natural State, when it comes to be Melted, diſcloſes its hidden Salt, and works on ♂ by a ſharp Acidity; conſidering this, I ſay, and that Men have confin'd themſelves to Acids in working on Steel, becauſe they ſuppos'd Inſtruments of that kind were neceſſary to diſſolve that Metal, I thought it might do you, and ſome Ingenious Men of your Profeſſion, ſome little Service, if I propos'd to you a way of Opening the Body of Steel, that tho I gave a hint of it divers Years ago, is, for ought I know, yet unpractis'd. We

We took then ſeveral Ounces of highly rectify'd Spirit of fermented (or putrify'd) Urine made *per ſe*, and conſequently without Quicklime, and pour'd it upon as much Filings of Steel freſhly made, to be ſure, not to have any Ruſty ones, as we gueſt, would at leaſt ſuffice to ſatiate it fully. Theſe we put in a moderately warm place, where the Menſtruum wrought on the Metal for divers hours together, and Diſſolv'd a conſiderable part of it. This Solution we ſet to filter, and found it of a Taſte conſiderably ſtrong, but very different from any of the Chalybeat Preparations, we remember'd, that were ſeen made with Acids. The Liquor being kept in a ſtopt Viol for ſome days near a Window, did in the Cold let fall by degrees a conſiderable quantity of Powder of a deep Green Colour, which ſurpriz'd ſome Virtuoſi, to whom I ſhew'd it, eſpecially becauſe the Liquor

it ſelf was not of that Colour; tho at leaſt the ſuperficial part of what remain'd (in plenty) in the Filter, did alſo in the Air acquire a Green Colour. But tho our Solution pour'd off from the ſubſided Powder, was warily and ſlowly evaporated, yet we did not find it would well Cryſtallize What uſe may be made in Phyſick, of Preparations of this kind, I leave to you, whoſe Profeſſion as well as Curioſity will ingage you to conſider. I do not preſume to tell you, but in general it ſeems that Steel Prepar'd with Volatile Spirits of the Animal Kingdom that are wont to be friendly to Nature, and are very contrary to Acids, may have new qualities very differing from thoſe of Steel Prepar'd with Acids, and may be more ſafe in ſome Caſes and to ſome Patients. With what other Volatile Menſtruums I have diſſolv'd *Mars*, and what Phænomena ſome Tryals I made with that Metal open'd by

ſuch

ſuch Salts, you may command an Account of, if you think it worth deſiring.

A Deſign'd Chymical Medicine.

Another Experiment that I made on Steel, was deſign'd to make as much of it Volatile, as I could with a Menſtruum, not ſo Corroſive or Dangerous to the Body as Oyl of Vitriol, or Spirit of Niter, which, eſpecially the former, are imploy'd by divers Chymiſts to make Chalybeat Preparations that yet are not Volatile. The Medicinal Scope I had in my Eye, for I had alſo a Chymical one (that belongs not to this place) was to try if I could by it obtain any *Sulphur* of *Mars*, which the Commendations that ſome, even of thoſe Chymiſts, whether *Adepti* or not, whoſe Authority I moſt regard, repreſent

as an excellent Medicine, eſpecially in Caſes that require Anodynes, and which the others, or the ſame ſpeak of as a graduatory Subſtance (as to ſome Metals) or both: If you ſhould ask me, why I did not make uſe of the common Vitriolum Martis, which is eaſy to be had in the Shops of Chymiſts? I anſwer, That my deſign being to try whether or no I could obtain a Sulphur, that might properly enough (tho not in the utmoſt rigor) we call *Sulphur* of *Mars*, that which is made the common way, would not anſwer my end, ſince tho I ſhould be able from this Vitriol to obtain a real *Sulphur*; yet I ſhould not think it ſafe thence to conclude, that it came from the Metal, and not from the Menſtruum; becauſe I have ſeveral times from Oyl of Vitriol it ſelf, obtain'd no contemptible proportion of Yellow and Combuſtible *Sulphur*. To which I add, that the acquiſition of a Metalline

Sul-

Sulphur, tho it was not the only thing that I aim'd at in this Preparation, for I preſum'd, that at leaſt I ſhould make a very great Comminution of the parts of Steel, which is one of the main things aim'd at by the more Rational Phyſicians in the Preparations of that Metal.

Upon theſe and the like grounds, I pitcht upon good Spirit of Sea-Salt as a Menſtruum, much fitter for my purpoſe than either Oyl of Vitriol or the Acid part of *Sulphur*; and accordingly in a good many Ounces of this Menſtruum, we diſſolv'd as much as we eaſily could of choice Filings of fine Steel, and having filter'd the Green Solution, we very ſlowly Evaporated it in a Glaſs Veſſel, and took ſuch care not to ſpoil the matter, that we had ſtore of fine Green Cryſtals that were not very ſmall, and lookt prettily; moſt of theſe we put into a ſtrong, but ſmall Retort, and by degrees of Fire, and a

ſtrong

ſtrong one, for the laſt hours; we obtain'd divers Ounces of a Liquor that came over in white Fumes, like Miſts driven by the Wind, and afforded a Sulphureous Smell: This Liquor we rectify'd, and had a Yellow Ponderous Spirit, that ſeem'd to be much more of Kin to the Spirit of Sea-Salt, than to the common Oyl of Vitriol; eſpecially ſince being mixt with Aqua-fortis, it would, like Spirit of Salt, make it a Menſtruum, that would even in the Cold Diſſolve Gold in thin Leaves. Which laſt words I add, becauſe having put into a little of it already made Yellow, by having diſſolv'd Leaf-Gold a very thin Plate, but a pretty deal thicker than a Leaf of Hammer'd Gold, the Menſtruum made it look all over white, almoſt like Silver, which ſeem'd to argue, that this Vitriolate Menſtruum differ'd from common Spirit of Salt. And however, it may be worth taking notice of by the

By, that not only Vitriols Blue, as is well known to Chymists, but that Vitriols of one of those Colours, and whereof the same Metal is the basest, may differ much from one another on the score of the various, and to us perhaps, unknown Menstruum that dissolves the Metal, since our Green Vitriol yeilds Liquors very different from common *English* Vitriol of *Mars* made with Oyl of Vitriol, tho all the three be green. Which may give us some Reason of the uncertainty, whereof Vitriol is mainly imploy'd; and 'tis perhaps worth remarking, that tho we did not find the Vitriol of *Mars* made the common way, nor even *Roman* Vitriol to dissolve in a Vinous Spirit totally Inflammable, yet it would easily enough Dissolve our Saline Vitriol, (if I may so call it) which Solution to hint that in *Transitu*, you may perhaps see cause to imploy as a Medicine in several Cases, and particularly as a Styptic in Wounds

Wounds, ſince its Taſt is very Aſtringent, its Parts very Subtil, and made fit by the Vinous Spirits to prevent Corruption; eſpecially in thoſe Clymates where Chirurgeons complain, That they can ſcarce prevent the Breeding of Worms in Wounds, unleſs they do betimes Dreſs them with *Spir.* of *Wine* or *Brandy*.

But that which we chiefly aim'd at in this Operation, was the dry part, of what was Elevated by the force of the Fire. This we found to be diſtinguiſhable, partly by its Situation, and partly by more durable Accidents, into three kinds of Subſtance, whereof one was almoſt like a Powder, which after the Contact of Air, did in a while come over to be of a Yellow Colour, almoſt like *Sulphur*, but it was not indeed truly Combuſtible *Sulphur*. The other Subſtance conſiſted of larger parts, and was of a deep Colour, between Read and Brown. But the third, which

ſeem'd

ſeem'd the moſt Copious of all, was made up of fine parts, larger than the former, of a deep Reddiſh Colour, and adorn'd with a fine Gloſs, like that of Scales of Fiſhes, that look'd very prettily.

The Caput Mortuum was found to be of a Texture that would have ſurpriz'd moſt Men; for a great part of it appeared to be turn'd into a Talky Subſtance, conſiſting of pretty broad and very thin Plates, ſmooth and gloſſy, that lay upon, and againſt one another, like thoſe that make up Muſcovia-Glaſs, when the pieces are more thick than large.

CHAP.

CHAP. V.

CONTAINING *Experiments and Obſervations Solitary; in two Pentades.*

The I. PENTADE.

EXPERIMENT I.

A notable Comminution of Gold into Powder that will ſink in Water.

TO manifeſt into how great a multitude of Corpuſcles, groſs and heavy enough to ſink to the bottom even of a Saline Liquor in the form of Precipitate or Powder; I thought of this Expedient. We took a Grain of Refin'd

fin'd Gold, and having diſſolv'd it without heat in a competent quantity of good *Aqua Regia*, we put to it by gueſs about two Spoonfuls of Water, and then by a Thread we hung in the mixture a little bit of clean metaline Body, and kept it ſuſpended in the Liquor for many hours (or ſome few days.) By this means we obtain'd, as we expected, a Precipitate of a fine and deep Colour, ſo copious and ſo light, that it was a long time before it would all ſettle at the bottom. Then looking upon the remaining part of the Suſpended Metaline Body, we found it ſo very little leſs than when the whole was firſt put in, that the diminution of it was not judg'd to amount to near a Grain. By which Experiment it appear'd, that one Grain of Gold, not ſwiming in parts ſeparately inviſible, as 'tis in Solutions, but reduc'd to a Manifeſt Powder, ſeem'd to make a conſiderable quantity of Precipitate

tate at the bottom of the Cylindrical Vial, whoſe Diameter was about an Inch, that we kept it in. And this Glaſs being a little ſhaken, the Precipitate would riſe like a Mud, and be ſo thorowly diſperſt in the form of a Powder, through the whole Body of the Liquor, and a greater quantity of Water added to it, that at firſt it would ſeem Opacous, and after ſome time, it would appear like a high and lovely Purple Solution. So that one Grain of Gold (for the Colour argu'd that there was ſome of that Metal, in every Corpuſcle of the Precipitate) was reduc'd into as many Grains of Powder, as ſuffic'd to lodg themſelves in all the Particles of ſpace great enough to be viſible, that were contain'd in a Maſs of ſixteen Drachms (is Two Ounces) of Water.

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EXPERIMENT II.

A Proof of the Metalline Nature of Granates.

I have elſe where endeavour'd to ſhew that divers, if not moſt, of the real Vertues of ſome Gems, (for there are too many Fabulous ones aſcrib'd to them) may in probability proceed from the Particles of Mineral Juices, that were admitted whilſt the matter was yet in *Solutis Principiis*, or at leaſt ſoft, and afterwards Coagulated with the Lapideſcent part of the Stone. In confirmation of this Conjecture, I ſhall now obſerve, that having, upon ſome grounds not neceſſary to be here mention'd, ſuſpected that Granates contain (ſome of them) beſides ſome other Metalline Subſtances, divers Corpuſcles of a Martial Nature; I made choice of ſome ſmall ones, which by their deep and almoſt dark

Colour, (to name no other Signs) I gueſs'd to contain ſomewhat of Iron or Steel; and apply'd to them a pretty vigorous Loadſtone, which as I expected, readily took them up, and to which they conſtantly ſtuck afterward, till I forcibly ſeparated them from it. But tho I try'd this upon more parcels of Garnets than one or two, yet I found that there was not many in one heap, that would eaſily adhere to the Magnet.

EXPERIMENT III.

A Gentleman Eminent for his Travels into Eaſtern Parts, and for his Skill in Jewels, told me, in Confirmation of my Opinion about the Origine of Gems from Fluid Materials; that he had ſeen a white Saphir that was a Table-Stone, as they ſpeak, *i. e.* flat and not cut in Facets, about the middle of which there was a Cavity about the bigneſs of a large Pins-head,

or

or ſmall Fitch, that contain'd in it a drop of Liquor that it ſeems could not be Coagulated into Stone with the reſt of the Matter: Which Liquor, he ſaid, was very eaſily diſcernible by its ſhifting places in the Cavity, when the Stone was put into differing Poſtures. And when I ask't, whether there was no Flaw or Commiſſure in the Stone, at which the Liquor may be ſuſpected to have got in; he aſſur'd me that there was none, but that the Cavity was every way encompaſt by the ſolid Stone, and was about the thickneſs of three Barly Corns beneath the upper Superficies of it.

SCHOLIUM.

It may be here fit to give notice once for all, about the Experiments that are in the following Collections, ſtyl'd *Solitary*, that tho moſt of them are deliver'd nakedly as

matters of Fact, without any ſuch Introduction or ſubſequent Reflection, as may be met with ſometimes expreſſly, and oftner by Intimation in divers others; yet that it ſhould not be thence infer'd, either thoſe that are ſimply recited, were lighted on by chance, or made at all adventures, or that they are of no uſe, becauſe for the moſt part there is not any expreſſly aſcribed to them: For as they were not written without a particular occaſion and ſcope too, ſo that many of them may be apply'd to good purpoſes, will, perchance, be found here and there in our other Writings. And to make it probable in general, that moſt of them may not be uſeleſs, it may perhaps ſuffice that we refer to what we have elſewhere purpoſely Diſcourſed, about the uſes of Experiments (even) to Speculative Philoſophy.

This may paſs for a general Scholium applicable to moſt of

thoſe Experiments that are not attended with any particular Scholium, nor any thing in the Experiment or Obſervation its ſelf, that may eaſily by an attentive Reader, be made to ſupply the place of a Scholium. Which laſt clauſe I add, to intimate, that beſides my haſt, another reaſon why ſo many *Scholium*'s, as may be expected in the following Collection, will not be found in it, was, becauſe the proemial part did, on ſeveral occaſions, make it needleſs to ſubjoyn *Annotations*.

EXPERIMENT IV.

An Ingenious and Credible Perſon (Mr. *W.*) aſſur'd me, that in one of the fine Gardens near *Genoa*, that he delighted to Viſit, there was a Pond, which being made on the ſide of a Hill, the Wall next the bottom of the Hill was ſo high, that Men could not look over it into the Pond, nor be at all

ſeen over it by the Fiſhes in the Pond; and yet he has ſeveral times obſerv'd theſe Fiſhes to be call'd together by the Gardiner, as he pleas'd, with a certain noiſe that the Gardiner made to aſſemble them, tho neither he nor any man elſe could be diſcover'd by the Fiſhes that readily obey'd their Summons.

This Relation may be of uſe in the Controverſy, Whether Fiſhes hear under Water.

EXPERIMENT V.

Upon occaſion of what is elſewhere ſaid of the Production of vivid apparent Colours by the breaking of the beams of Light, on Corpuſcles extraordinary Minute, tho ſolid; I took a Globe of rock Chryſtal, which being for a certain uſe ſaw'n in two by a Cutter of Gems, and having lookt upon the flat Surfaces, obſerved to the Sun Beams, the lit-

tle

tle Particles that (notwithſtanding their ſeeming ſmoothneſs in the Shade) aſperated their Surfaces, did ſo retract and reflect the Light, as to make them exceed the vivid Colours of the Rain-bow, (but in a ſomewhat interrupted manner) ſometimes on one part of the Surface, ſometimes on another, as the Surface happen'd to be Scituated in reference to the Sun.

And having cauſed a choice and fine Grain'd Touch-ſtone to be likewiſe ſaw'n aſunder by the ſame Artificer, to make two of it; I obſerved upon the new Surfaces made by this Action, that to the Touch ſmooth and poliſh'd, ſuch vivid Colours as I lately mention'd to be theſe Surfaces, were put in ſo various Poſition in reference to the Sun and the Eye; ſo that notwithſtanding the great tranſparency of the Chryſtal and great Opacity of the Touch-ſtone, their ſuperficial Corpuſcles were found fit to exhibit (in due poſitions) the

vivid Colours we admire in the Rain-bow.

The II. PENTADE.

EXPERIMENT I.

Having for leſs than two hours borrow'd an *Oculus Mundi*, whoſe Colour was White, whoſe Figure was Round and plain Convex, and whoſe Diameter, I judg'd, to be about a third part of an Inch (rather leſs than more) I put it into a very ſhallow Glaſs Veſſel almoſt fill'd with fair Water, and obſerv'd within one Minute, or thereabout, with the Minute-Watch, that one part of the Edg began to appear ſomewhat Diaphanous, and the whole Stone did by degrees loſe its Whiteneſs, appearing of a dark Browniſh Colour: When this Change had reach'd the whole Surface, I look'd upon my Watch, and found that the Stone had lain

10 Cent. 12.

nine

nine Minutes in the Water; out of which having taken it, I perceiv'd the Body was grown *Semi-Diaphanous*, and the parts near the Edg being leſs thick, appear'd to have loſt much more of their former Opacity than the innermoſt part had. Then putting the Stone preſently into the Water again, I let it lye there ſo long till the Time efflux'd, ſince the begining of the Experiment amounted juſt to half an Hour. Then taking it out, and wiping it, I found it was grown much more clear, ſince being held againſt the light, it look'd almoſt like Yellow Amber, but not quite ſo Diaphanous. Then I expos'd it to the Contact of the Air, in the Scales of a very good Ballance (where it weigh'd four Grains and about a quarter) and left it for a quarter, or near half an Hour, in that Ballance to try if by the receſs of any imbib'd aqueous Moiſture it would become lighter; but want of Time hindred me from com-

compleating the Experiment, but did not deter me from making another Obſervation, which was, that within about a ſingle Minute of an Hour, a portion of the Stone near one part of the Edg, was manifeſtly grown Opacous and Whitiſh, and within not many Minutes after, the whole Stone began to appear in a changing condition, but did not change in every part at once, nor did the alteration make an uniform Progreſſion; but here one might ſucceſſively diſcover divers white Arches, or as 'twere Zones, that were parallel enough to one another, and being quite Opacous, intercepted between them other little Zones, which being yet Semi-opacous, appear'd of a Brown Colour, and concurr'd to make the Stone look like a very pretty Agate, wherein the Whiteneſs made a continued Progreſs as long as the Time permitted me to obſerve it: And the Poſſeſſor aſſur'd me, that within

in anHour or or two it would be all of a Cream White (as he expreſs'd himſelf) which I thought the more Credible, becauſe I ſaw one part of it, that was pretty broad, to have obtain'd already a Whiteneſs, little, if at all inferiour to that of Ivory.

EXPERIMENT II.

Remarkable Obſervations about Hurricanes.

The late Governour of the *Bermudas* Iſlands, (very much ſubject to Hurricanes) in Anſwer to my Queſtions, about the Preſages of thoſe hideous Tempeſts, inform'd me, that theſe were of the principal Forerunners. Firſt, That the Sea would manifeſtly ſwell at ſome diſtance from the Shores, inſomuch, that the Fiſhermen would divers times make to Land, and warn the Inhabitants, upon the confidence of that Preſage, to pro-

provide againſt that diſmal Storm, tho the Sea were then ſmooth enough. Secondly, That the Sea would beat with great Noiſe againſt the Shore, eſpecially the Rocks, tho there appear'd no manifeſt Cauſe, as upon the account of the Wind or Tide, why it ſhould do ſo. And this Sign would ſometimes not appear till many Hours, or perhaps a full Day after that foremention'd. And ſometimes 'twas obſerv'd, that the Sea would now and then ſuddenly Invade the Shore, and gain further upon it than could be accounted for by the Wind or Tide, and then quickly Ebb away beyond the uſual Low water-Mark, and after return again with more fury, and fall back further than before. Thirdly, That ſometimes there would be perceiv'd an ungrateful Smell in the Air, before the Hurricane began to Blow. And Fourthly and Laſtly, My Relator affirm'd to me, both he and others

others had ſeen many Bundles, as it were of long Streaks of differing Colours, ſome Whitiſh, ſome Reddiſh, and ſome Blewiſh, or Greeniſh, which by reaſon of their Figure are uſually call'd in thoſe parts Horſe-Tails: And theſe were ſeen in parts of the Sky, where the Air was Troubled indeed, but yet no form'd Clouds did appear to the Eye.

EXPERIMENT. III.

A Monſtrous Pearl.

Yeſterday a curious Perſon came to ſhew me a Monſtrous Pearl, if I may ſo call it, becauſe it was very irregularly ſhap'd, and of an Enormous bigneſs. For tho it were ſo artificially ſet in Gold, that by the help of a little of that Metal fitly plac'd here and there, the whole Jewel repreſented a Lion; yet I made ſhift to Meaſure it exactly Decemb. 23.

actly enough with a Pair of *Calapar Compasses*, (as they call those whose Legs are made Arch-wise) and found the Length to be just an Inch and an Half, and the greatest Breadth (where yet it was of a proportionate Thickness) to be $\frac{3}{10}$ or $\frac{4}{10}$ of an Inch. The Colour was Orient enough, all but one dark Spot, which by its size, figure, and situation, I guess'd to be the remains of that Part (whether like an Umbilical Cord or no) whereby it was fasten'd to the Naker or Shell of the Fish that produc'd it.

EXPERIMENT IV.

An odd Observation about the Influence of the Moon.

I know an Intelligent Person, that having by a very dangerous Fall, so broken his Head, that divers large Pieces of his Skull were taken out, as I could easily perceive

ceive by the wide Scars that ſtill remain; Anſwer'd me, that for divers Months that he lay under the Chirurgeons Hands, he conſtantly obſerv'd, that about Full Moon, there would be extraordinary Prickings and Shootings in the wounded Parts of his Head, as if the Meninges were ſtretched or preſs'd againſt the rugged Parts of the broken Skull, and this with ſo much pain, as would for 2 or 3 Nights hinder his Sleep, of which at all other times of the Moon he us'd to injoy a competency. And this Gentleman added, that the Chirurgeons, (for he had 3 or 4 at once) obſerv'd from Month to Month, as well as he, the Operation of the Full Moon upon his Head, informing him, that they then manifeſtly perceived an Expanſion or Intumeſcence of his Brain; which appear'd not at all at the New Moon; (for that I particularly ask'd) nor was he then obnoxious to the forementi-on'd Pricking pains. EX-

EXPERIMENT. V.

An uncommon Experiment about Heat and Cold.

To confirm what we have elſe-
where deliver'd a-
Nov. 9. 89. bout the Mechanical Origine of Heat and Cold, we devis'd the following Experiment: We took a ſmall and hermetically ſeal'd Thermoſcope, whoſe Stem was divided into parts, equal enough as to Senſe, by little Specks of Amel, that ſharp Liquors might not eat off or ſpoil the Marks. The Ball of this Inſtrument we put into a ſlender Cylindrical Veſſel, (call'd in the Shops a Muſtard Glaſs) and more than cover'd it with ſtrong Oyl of ☉, and left it there awhile to be reduc'd to the temper of the ſurrounding Liquor. Then we caſt upon it by degrees, groſly Powder'd, * which preſently

was

was wrought on furiouſly by the *Menſtruum*; and by this Conflict, was produc'd a ſeeming Efferveſcence, with great noiſe and ſtore of Froth, which more than once was ready to run out of the Veſſel. But for all this ſeeming Ebullition, the mixture inſtead of growing Hot, did really grow Colder and Colder, as appear'd not only when the Veſſel was touch'd by the Fingers on the outſide, but by a ſurer mark, which was the deſcent of the colour'd *Spirit* of *Wine*. How much farther it would have deſcended, (for the Liquor was not near ſatiated with the ☉) we were hinder'd from Diſcovering by an unlucky Accident, that broke the Thermometer, and put an end to that *Firſt* part of our Experiment. But this was no hindrance to the *Second* part, which for its Novelty we mainly deſign'd. For when we pour'd this actually and conſiderably

Cold Mixture into three or four times its weight (by gueſs) of as much common Water, that was likewiſe actually Cold; this *Second* Mixture did, as I expected, immediately grow ſo Hot, that I did not like to keep my Finger for a Minute or two upon the outſide of the Glaſs.

An

An Advertiſement about the Nature and Scope of the Chymical Experiments contain'd in the following Pentades.

CHAP. V.

Containing two Pentades of Chymical Experiments.

BEfore you enter upon the perusal of the following *Pentades*, I think my ſelf oblig'd to give you notice, that you will be deceiv'd if you expect to find them conſiſt, either *Solely* or *Mainly*, of Spagirical Secrets, or difficult and elaborate Proceſſes. I do not in-

deed deny, that I am not altogether unfurniſh'd with ſuch as in probability, moſt Readers would refer to Experiments of that Nature, and you may find divers of them ſcatter'd upon fit occaſions, in ſeveral of my Writings: But in the preſent Tract, tho I have not forborn to mention here and there as many Particulars of that ſort, as I thought neceſſary to excite and maintain the Curioſity, and ſuſtain the Attention of a Reader that Reliſhes nothing that is not Seaſon'd with ſomewhat that is not common; yet in this Treatiſe, wherein I aim'd not to appear a Chymiſt, ſo much as to make my Reader a Naturaliſt; it was more ſuitable to my deſign, tho not more conducive to my Credit, that the following *Pentades* (which God permitting, may in tract of time, much increaſe in Number) ſhould mainly conſiſt of Experiments, rather uſeful than Specious; my deſign being to contribute

tribute ſome ſound Materials towards the Erection of a ſolid and uſeful Natural Philoſophy. In making choice of which Materials, I uſually prefer thoſe Experiments that afford the more Light to thoſe that appear with the moſt Luſter, and thoſe that are proper to increaſe the Readers skill, to thoſe that make an Oſtentation of the Writers. On which ground it is, that, whatever I may do, where I purpoſely Recommend Chymiſtry, I make this ſmall Collection, conſiſt mainly of ſimple and not Intricate or elaborate Experiments. Thoſe that are Simple being not only more eaſy to be Try'd, and if need be, Reiterated without much trouble, or danger of erring; but (which I more regard) more eaſy to be judg'd of, as to their Cauſes, *Phænomena* and effects, and conſequently more fit to ground Notions and Reaſonings upon: Divers of which may probably in the applications that

ſagacious Perſons may make of them, prove to be of Practical as well as Theorical uſe. Thus tho a Wedg of Gold and a Diamond be, one more Rich and finely Colour'd, and the other more precious and ſparkling than a piece of Steel and a Flint; yet on many occaſions the two latter are far more ſerviceable to Mankind than the former: Since not thoſe that are more priz'd for themſelves, but thoſe that in compariſon ſeem deſpicable, afford Sparks, which do not only give Light, but are fit to kindle Fires, which both afford incomparably more Light, and in the application are of excellent and neceſſary uſe in the Kitchins of Families, the Forges of Smiths of all ſorts, the Furnaces of Myne-men, and the Laboratories of Chymiſts.

The I. PENTADE.

EXPERIMENT I.

To Diſſolve Crude Gold with dry Bodies.

Becauſe the generality of Chymiſts make ſo great a matter of *Aurum Potabile*, tho they cannot deny, but that by their Preparations it is not made irreducible; and becauſe alſo I am willing to grant, that even ſome Preparations, that leave the Metal reducible, may yet be of conſiderable uſe in Phyſick (the grounds of which Opinion I elſewhere declare, and ſhall not here repeat) I will in this place ſet down a Proceſs, which tho I do not overmuch value, ſerv'd me well enough on ſome occaſions, to Vye with thoſe that much vaunted their particular ways (as they thought them) of making *Aurum Potabile*. I told them, I could

make one in an hour or two's time without a Furnace; and that without any other Diſtill'd Liquor whatſoever than common Spirit of of Wine well Dephlegm'd.

This I did ſeveral times, after the following manner. I prepar'd a Saline Mixture conſiſting of one part of *Sal Almoniac*, two parts of *Roch Allum*, and four parts of *pure Nitre*. This being well pulveriz'd and mingl'd, I rub'd diligently in a Glaſs or Marble Mortar, with 15 or 16 parts in weight of the whole Mixture of Leaves of Gold, ſuch as Apothecaries and Book-binders uſe. Then I put this into a ſmall new Crucible, and putting a few, and but a few, kindled Coals round about it, and at a little diſtance from it, to neal the Veſſel; I ſoon after approacht them, till the heat made the Matter melt, and ſo with that gentle Fire, I kept it in fuſion, till it viſibly emitted no more Fumes but grew dry again.

This

This ſign appearing, I preſently took it off from the Fire, and whiles it was yet warm. dug it out, as clean as I could, and having ſeaſonably pulveriz'd it, that it might not attract the Moiſture of the Air; I put upon it ſome highly rectify'd Spirit of Wine, which within an hour or leſs time, was enobled with a rich Golden Colour. And accordingly I found it to be a real Solution of Gold, by divers Tryals that I purpoſely made, to evince it to be ſo.

Of this and ſome other leſs common Preparations of ☉ more may be met with hereafter.

EXPERIMENT. II.

Luna Cornea by Diſtillation.

There was taken ℥III of well refin'd Silver, thinly Laminated, and ſix of common Sublimate. This was put firſt into a Retort, and

and the Silver cut into ſmall pieces, was put in after, that the matter lying uppermoſt might be Penetrated by the aſcending Fumes: But the Fire having not been made ſtrong enough, the Sublimate was Elevated to the uppermoſt part of the Retort, and left the Silver ſcarce at all chang'd in the bottom of the Glaſs. Wherefore we put the ſame Sublimate and Metal into another Retort, and adminiſtring a ſtronger Fire, that the Sublimate might be thorowly melted before it could flee away, we obtain'd no running Mercury at all, but the greateſt part of the Sublimate was Elevated in its uſual form, leaving behind it the Silver in a Lump, which ſtuck hard to the bottom of the Glaſs, and appear'd much alter'd. For beſides that there was acquir'd ℥I. in weight, many of the pieces of Metal ſtuck together, and ſeem'd at leaſt half Melted, and were of a kind of Horny and

Semi-

Semi-Diaphanous Subſtance, which would readily enough Melt almoſt like Sealing-Wax, when I held it to the Flame of a Candle, at which yet I could not perceive it manifeſtly to take Fire.

SCHOLIUM.

'Tis here to be noted once for all, that in this and divers other Chymical Experiments, there is ſometimes much more deliver'd than is neceſſary to make good the Title, or the thing mainly intended. But 'twas thought fit, not to Diſmember or Mutilate the entire *Memoir* as 'twas regiſter'd, becauſe that of the other Particulars ſome may be, tho indirectly, refer'd to the principal part, and others may be look't on as *Phænomena*, which may be of uſe at leaſt to me, by keeping me from forgetting them, and probably tend to the main deſign of all theſe Experiments, *viz.* to

con-

contribute to a Natural Hiſtory, which may reſpect Practice, as well as Theory.

EXPERIMENT. III.

Mercury *growing warm with Silver.*

We took ʒII of animated (or antimonial) Quickſilver, and put it into the palm of ones Hand; we put to it by degrees a Dram and an Half of Powder of fine Silver, made by Precipitation with Copper the ordinary way (but with more than ordinary care). Whilſt this Mixture was making with ones Finger, he that held it in his hand, confeſs'd he found it grow ſenſibly Warm; and I, whoſe Finger was conſiderably Warm, could not with it perceive any coldneſs in the Amalgame. This in a very ſhort time became of a ſoft, and (as to ſenſe) uniform conſiſtence, and ſo ſoft that it was like almoſt melted Butter,

in-

inſomuch that we added half a Dram more of the Calx of Silver, without rendring the Amalgame at all too ſtif; and perhaps we might have added the other half Dram, without overcharging that penetrant Mercury: in which caſe it had ſwallowed up full its own weight of Silver; ſo different it was from common Mercury; and when we left off, it had reduc'd into a very yeilding form, three quarters of its own weight of ſolid Metal. This $\overline{aaa}$ we put into a ſmall Vyal, and ſtopt the Glaſs with a Cork, to obſerve whether the Amalgame would harden without intercourſe with the free Air. Next morning it appear'd to be concreted in the Glaſs; and the next morning after that, we broke the Glaſs to take out the Matter, which we found conſiderably hard, but brittle enough.

EXPERIMENT. IV.

The Durableneſs of the Faculty of a certain prepar'd Mercury *to grow Hot with Gold.*

To convince thoſe that Treat the Incaleſcenſe of Prepar'd Mercury and of Gold, as a Chymical Chymera; I ſent in a Conceal'd way to the Royal Society, ſome Mercury laborioufly Prepar'd in my Furnaces, whereof ℥I. being put upon a due proportion of a Calx of Gold made by the common way, (Quartation) they grew preſently and very ſenſibly hot in the Palm of ones Hand. I ſhall now add, that to try whether this ſurprizing Faculty of growing hot immediately upon Gold, will continue any long time in the Mercury; I lately took ſome that I had (for a certain purpoſe) kept Hermetically ſeal'd in a Glaſs Egg for divers Years, (if I miſtake not, Ten

Ten or Twelve at leaſt) and having Reiterated the foremention'd Tryal with it; firſt alone, and then in the preſence of a Cultivator of Chymiſtry; it preſently grew hot with the ☉ in the palm of the Hand. And having Diſtill'd off the Mercury, and try'd it again as well as ſome that was Undiſtill'd, if I much miſremember not, it did again heat with the Gold.

EXPERIMENT. V.

An uncommon way of Operating upon ♂.

When Chymiſts expoſe Antimony, for inſtance, and divers other Conſiſtent, but not fixt Bodies, to the action of the Fire, they are wont to do it in Veſſels, either open, as when they make Calx, or Glaſs of Antimony, or at leaſt in Veſſels that are not ſo cloſe: But that there is Air includ-

ed

ed with the matter, as when they Sublime it in Glaſſes, or in Earthen ſubliming Pots; and tho they regard not this included Air, becauſe uſually there is not much of it in the Veſſel, yet it may have a not inconſiderable influence on the effects of the Fires Operation, not only as it contributes to the aſcention and ſuſtentation of diſſipated parts of the Mineral, but as it affords theſe Corpuſcles room to fly to and fro in it, and thereby make Aſſociations or Coalitions and Concretions that otherwiſe would not be produc'd. Upon this account I gueſt that it may be, on divers occaſions, a thing of uſe for Diſcoveries, and perhaps too, for Practice, to imploy a Method, that the Body expos'd to the action of the Fire, may be kept from the Contact of the Air, at leaſt as to any ſenſible portions of it, and being as it were included in Bodies almoſt equivalent to Solids; and one may

ſup-

ſuppreſs the free emiſſion and aſcent of Exhalations, and ſo to make an Operation, not only in Clauſo, but as it were in Solido, and reduce the parts of the Body Expos'd, and perhaps the Igneous Corpuſcles to act reciprocally upon one another, without any notable Diſſipation, or Avolation of Parts.

To apply now what hath been ſaid, to Antimony; I ſhall briefly ſet down an uncommon way that came into my mind of Operating upon it. We took well powder'd ♂, and well dry'd (white) Chalk reduc'd likewiſe to Powder; with theſe in a large Earthen Pot or Crucible, we made SSS. having a care to make the lowermoſt and uppermoſt bed of Chalk, and the laſt thicker than any of the reſt, as alſo that none of the *Antimo-nial* Layers, were but of a moderate thickneſs, that the Heat might penetrate them the better; then the Veſſel, being cover'd, was put

among the kindled Coals of a good digeſtive Furnace, (not becauſe ſuch a one was neceſſary, but becauſe 'twas at hand) where 'twas kept for a competent time, which according to the bigneſs of the Pot, and the ſtrength of the Fire, may be ſometimes 20 or 24 Hours, ſometimes a Day and a Half, and ſometimes two Days or better.

The II. PENTADE.

EXPERIMENT I.

A very uncommon way of making a Cale of Gold.

'Tis known that moſt Chymiſts, and many Phyſicians, have a Superlative Eſteem for the Medicinal Vertues of Gold, and the Preparations of it. And upon this ground, divers of them have long been, and ſtill are Solicitous to make *Calces* of Gold by differing ways;

ways; moſt of them laborious, and ſome of them ſcarce to be ſafely wrought and us'd in Phyſick: Wherefore I ſhall, I preſume, be eaſily Pardon'd, if I here ſet down a way that came into my mind, and that I have ſometimes us'd to make a preparation wherein Gold is reduc'd to very minute Parts, without the help of *Mercury*, or of any Precipitation made by ſharp Salts, whether Acid or Lixivial.

We took then refin'd Gold, and diſſolv'd it in clean and Spirituous *Aqua Regia*, and inſtead of Precipitating the clear Solution with Oyl of Tartar *per deliquium*, as is uſually done, or with Spirit of *Sal Armoniac*, or other Volatile Urinous Spirits, we firſt with a very modeſt Heat drew off the Superfluous Liquor; whereby the Gold with the remaining part of the *Menſtruum*, was left in the appearance of a thick and Oleous Liquor. This done, we pour'd

upon it a treble weight of Vinous Spirit totally inflammable and in a ſhort time, we had, as we expected, a very ſubtil Powder, or high colour'd *Calx* of Gold, that ſubſided at the bottom; the *Menſtruum* being ſtrangely dulcifi'd as to Taſt, and become fragrant in point of Smell When a very few days were paſt, we decanted the Liquor, and put on it freſh ardent Spirit, and leaving them a while together, there ſubſided the like well colour'd *Calx* more plentifully than the firſt time.

I know not, to add that upon the by, whether it may, or may not be worth while to try to Diſcover whether this Dulcifi'd A. R. *Spirituoſa* being drawn off from the ſubſiding Gold, may have acquir'd any Virtue from the open'd Metal. Some Tryals ſeeming to argue that the openneſs of this *Calx* made it fit to be eaſily wrought upon by a *Menſtruum* that would not touch Water-Gold, as they call

call the common *Calx* made by quartation, nor, yet Leaf-Gold, ſuch as the Apothecaries Imploy; but however the *Menſtruum* has acquir'd ſuch qualities as make it ſeem likely to prove an uſeful Medicine, which yet I refer to Tryal.

By the way we pitch'd upon to make this Powder of Gold, it ſeem'd probable, that it would not (at leaſt) be leſs ſubtil, and yet would be more mild, than common Preparations; and nevertheleſs we thought it might, perhaps, make it yet more ſecure, if we ſhould, as we did, put upon it a totally Ardent Vinous Spirit, and burn it off once, twice, or thrice, to carry off with it any little Coroſive or Saline Particles, that may have ſtill adher'd to the Metalline ones.

N. B. The Spirituous *Aqua Regia*, mention'd in the Proceſs, is ſo call'd by me, partly to diſtinguiſh it from the common *Aqua Regia*, and partly becauſe 'tis indeed of a

more Spirituous Nature than the common, being compos'd without any groſs Salt; Such as * but only of Spirits. This *Menſtruum* I made for ſome particular uſes: And tho it works more ſlowly than the common *Chryſulca*, yet I often prefer it to this, as that which I can imploy to ſome uncommon purpoſes, and as it may probably be a more innocent *Menſtruum* in making Preparations of *Sol*, deſign'd for Medicinal uſes. I make it very eaſily, by mixing one part of good Spirit of Salt, with two parts of ſtrong Spirit of Niter, or (when 'tis not to be us'd for Medicines) of common, but clean *Aqua Fortis*.

SCHOLIUM.

The above recited Tryal was made as 'tis deliver'd; but ſome Circumſtances that I took notice of, and particularly ſome Grains of Powder that, tho mingl'd with the

the reſt, were ſhining, as if they had been extreamly Minute, and bright Filings of Gold. Theſe Circumſtances, I ſay, made me Suſpect that the Succeſs might much depend upon particular and nice Circumſtances that may need more exact Tryal, than I had then occaſion to make; and therefore it may be fit that the Experiment be heedfully repeated. It may alſo be try'd whether the imploying common A. R. inſtead of the Spirituous, will much vary the Experiment.

EXPERIMENT II.

To try how much Volatile Salt an aſſign'd quantity of Water would Diſſolve, we took ℥III of Diſtill'd Water, and put into it by degrees, ſome dry Salt of *Salt Armoniac* (that was very White, and compact enough) keeping the Liquor in digeſtion for a pretty while, that it might have time to

Diſſolve as much as it could. When we found it would Diſſolve no more in a moderate Heat, we took it off, and found that after ſtanding ſome Hours in the Cold there fell to the lower part of the Glaſs, and ſetled there, a pretty quantity of Salt, which we gueſs'd to be about ʒII, which being deducted from ℥II, that had been in all put in, there remained ℥I and ʒVI in the Liquor, which by this account had Diſſolv'd at leaſt half its weight of Salt.

SCHOLIUM.

I deſire it may not be thought ſtrange, if among our Chymical Experiments, ſome few ſhall be here and there met with, that are much leſs Elaborate or Promiſing than others that I could eaſily have inſerted in their Rooms; for I did it on ſet purpoſe, *partly* becauſe oftentimes (as was intimated at the beginning of the Chapter) ſome

ſome more ſimple or ſeemingly leſs valuable Experiments may be fitter materials, than more curious ones, for the Natural Hiſtory we would promote; and *partly* to give an Example, if mine can ſignifie any thing, of not diſdaining to Regiſter ſome things that ſeem mean; if by the light they afford, or the uſes they may be apply'd to, they compenſate the want of Luſtre, and of immediate Utility. And the ſubſtance of this Scholium I deſire may be mentally tranſferr'd, as occaſion ſhall require, to thoſe following Chapters that Treat of Chymical Experiments.

EXPERIMENT. III.

Perhaps ſome Chymiſts will think that the following Memoir may give hints that may be of uſe on ſeveral occaſions, both for other purpoſes, and for theirs, that would draw Tinctures from ſeveral Bodies, that will not afford them

them in ſimple *Spirit of Wine*, tho well rectifi'd.

The ſimple Spirit of good French Verdigreas, being once or twice abſtracted from as much Salt of Tartar as it would diſſolve in the Cold; left the Salt eaſily fuſible, and diſſoluble in highly rectifi'd *Spirit of Wine*.

EXPERIMENT IV.

I have not been unacquainted with ſome Curious and Elaborate Preparations of that noble Flower the Roſe; and experience hath convinc'd me that 'tis poſſible, whatever moſt Chymiſts think of it, to obtain from Roſes a true eſſential Oyl, that mixes not with Water, and is exceeding fragrant: But there are ſeveral that are ſo far from believing that an Eſſential Oyl may be obtain'd from Roſes, without being in the form of a Butter, but in a liquid one like Oyl of Cloves, or Wormwood, that

that they doubt whether a true *Spiritus Ardens* can be obtain'd from them, without addition of Wine, or ſome ſuch inflamable Liquor. I ſhall here tranſcribe the following Note, as containing a more ſimple and eaſie Preparation (than any of thoſe before menti-on'd) of the Ardent Spirit of thoſe Flowers, and therefore more ſuitable to the deſign of the whole Chapter.

To make an inflammable Spirit of Roſes.

Two Buſhels of Damask Roſes (together with a good number of red Roſe-buds) being beaten, and put into a Veſſel with Water amounting to about 4 Gallons, were mingled with about a quart of Ale-Yeſt, and kept in Fermentation for about 5 or 6 days (the weather being cold for the Seaſon) and then being Diſtill'd *per veſicam*, afforded

afforded us a Spiritus Ardens.

EXPERIMENT. V.

An Experiment about the Chymical Analyſis of Pearls.

We took ℥II of Seed Pearl, that were carefully bought for Oriental, and without breaking them, put them into a Retort, and Diſtil'd them in a Sand-Furnace by degrees of Fire, giving a ſtrong one at the laſt. By this means we had a little Black Oyl Swiming upon the Spirit, which was alſo dark and muddy, as if incorporated with ſome more Oyl. The weight of both theſe Liquors was 23 Grains, beſides which there ſtuck to almoſt all the upper part of the Retort, a thin film of Oyl, which together with a ſtreak of the like reaching to the bottom of the Receiver, we eſtimated at 3 Grains more, and ſo reckon'd 26 Grains for the weight of the whole aſcended

cended matter. The *Caput Mortuum* amounted to full the remaining weight of two Ounces. The Empyreumatical Liquors that came over, ſmell'd much like thoſe of Harts-horn, and the Spirit was found to belong, as we expected, to the Tribe of Urinous ones, or, as many now call them Volatile Alcaly's For it readily hiſs'd and produc'd Bubbles, with good Spirit of Salt turn'd Syrup of Violets Green, and being drop'd into Solution of Sublimate, turn'd that White; to omit another way or two, by which I examin'd it. The Oyl that ſtuck to the Retort, and which was fætid, like that of Harts-horn, did eaſily diſſolve in dephlegm'd Spirit of Wine, and afforded a reddiſh Brown Solution. The *Caput Mortuum* was very black, and ſome Grains of it were found readily enough diſſoluble in Spirit of Vinegar. Being calcin'd in a well cover'd Crucible, with a ſtrong Fire (for a moderate one will

will not do it, unleſs it be long) we reduc'd them to be purely White, and to a weight leſs by ſome Grains than an Ounce, and ʒHI and we found, as we expected, that being Pulveriz'd, this Calx taſted hot and bitteriſh upon the Tongue, like good Calx Vive, and was not only of an Alcaliſate, but a Lixival Nature : For beſides that it preſently turn'd Syrup of Violets Green, it quickly afforded an Orange Colour'd Precipitate, with Solution of Sublimate.

Strange

Strange Reports,

In II. PARTS.

Addreſs'd to a Vertuoſo, Friend to the Author.

Advertisement.

I *Presume, Sir, you may yet remember, what I Wrote about the Nature and Scope of my Collection of Strange Reports, in an Essay which takes its Title from them; and which I was encouraged to make by the Example and Authority of* Aristotle. *And therefore I shall desire, that to save your Trouble and my own, That Paper may serve for a Preface to that which follows. About which,*

This Famous Philosopher in his little Tract, whose Title some render *de Mirandis Auditionibus*, scrupled not to comprise without Method, divers Reports, uncertain or fabulous, nor to insert several that were not so cautiously admitted as those recited in the following Collection.

M *sup-*

ſuppoſing this Requeſt to be Granted, *I ſhall need to give you at preſent but this ſhort* Advertiſement; *That for diſtinction's ſake, I thought fit to divide the enſuing Particulars into two Parts, becauſe they are indeed of two ſorts: One relating to things purely* Natural, *and the other conſiſting of* Phænomena, *that are, or ſeem to be, of a Supernatural Kind or Order.*

The firſt Set of Particulars belonging to each of the two forementiond Parts, has prefixt to it the Title of the Firſt Section, *tho it be not at this time attended by a* Second; *becauſe 'tis deſign'd, that God permitting, it ſhall be ſo hereafter*

after, when I ſhall get time to pick up out of my Adverſaria, *and other* Memoirs, *Particulars fit to have plac'd in the Liſt of* Strange Reports.

I muſt likewiſe give you notice, That you are not to expect the II. Part *at this time: Diſcretion forbidding me to let that appear, till I ſee what Entertainment will be given to the* I. Part, *that conſiſts but of Relations far leſs ſtrange than thoſe that make up the other Part.*

Strange Reports.

PART. I.

SECTION. I.

RElating to a judicious Virtuoso, that a Physician of Bruxels a while since affirm'd to me, That he himself had prepar'd 3 or 4 resuscitable Plants, one of which he had presented to the Marquess of *Castel Rodrigo*, now Governor of the *Spanish Netherlands*, where this Virtuoso had not long since been. Relating this, I say, to this Gentleman, and Enquiring of him, whether he had

ſeen this reſuſcitable Plant; he anſwered me, That he had never ſeen nor heard of it; but told me on this occaſion, That coming to *Deal* with an Apothecary of *Nimier*, if I miſremember not the Name, much eſteem'd for his extraordinary Skill in Chymiſtry about ſome choice Preparations, wherewith this Man's Shop was furniſh'd the Apothecary told the Virtuoſo, that he had really prepar'd reſuſcitable Plants, a different way from that which others pretended to, and that he could prepare a great variety of them. And when having enquir'd of the Virtuoſo, whether he himſelf had ſeen any of theſe prepar'd Plants, he aſſur'd me, that he had ſeen not only ſome, but many; I then upon farther enquiry how they appear'd, learned that the Chymiſt had divers of them in diſtinct Glaſs-Bottles; that the Apparitions that were exhibited, ſhew'd not the peculiar Colours, but only the ſhape

of

of the Plant; but this so genuinely that he could perfectly distinguish and easily know it to be such or such a Plant, instancing particularly in *Carduus Benedictus*, and *Camomile*.

And the difference betwixt this way of Exhibiting Plants, and that which is mention'd by *Quercetan*, and pretended to by others; I found by this Gentleman's Answers, to consist chiefly in these two things: The first, that the Apothecary's Plants did not as the others seem to grow up into the Air included in a Seal'd Vial, but were seen as growing in a clear Liquor, wherewith the Bottle that contain'd it was almost fill'd; and the next, That whereas to make the Apparition, mention'd by *Quercetan*, and others, the Application of an actual Heat (as that of a Lamp, or the Sun-beams, or the like) is affirm'd to be requisite, upon the absence of which the Phantastical Plant relapses into its

Ashes. In the formation of the Apothecaries Vegetables, he doth not employ any actual Heat, but (which may seem more strange) only the shaking of the Bottle, for upon that Agitation the prepar'd Ashes or Powder being rais'd from the bottom, and dispers'd quite through the Liquor, when the Glass is set by in a quiet place, the scatter'd Particles by degrees so convene, as to compose a Model of the Plant they once belong'd to. And Heat not being requisite to their formation, these Plants do not quickly, as the *Polonian* Physician's Phantastick Vegetable, Recorded by *Quercetan*, fall back into a Powder; but if let alone, continu'd a great while, until the Preparer think fit by a gentle Agitation of the Bottle, to dissolve the loose Contexture of it.

RE-

RELATION II.

I met the other day with a very intelligent Perſon, well vers'd in Chymiſtry, not credulous, and in a word very well worthy of Credit, who aſſur'd me, that he had himſelf ſeen a few years ago at *Mentz*, in the Hands of one Monſieur *P—r*, a Gentleman of *Switzer-land*, and a *Virtuoſo*, a piece of Glaſs about the bigneſs of a Shilling, or ſomewhat bigger; which was Red and pretty tranſparent like Glaſs of *Antimony* made *per ſe*, and which this Monſieur *P.* affirm'd to the Relator, that he Hammer'd before the preſent Elector of *Heidelberg* (to whom I told him, I had the Honour to be known, and) by whom the Relator was about that time imploy'd. And this Monſieur *P.* being his intimate Acquaintance, and perceiving that he was, (as he well might be) indiſpos'd to believe ſo ſtrange a thing

a thing, after he had confeſt the Glaſs to have been given him by an excellent Chymiſt in his Country (*Switzerland*); this Gentleman, I ſay, at the Relators earneſt Requeſt, gave him leave for his ſatisfaction, to lay the piece of Glaſs upon an Anvil, and to ſtrike ſeven or eight ſtrokes with a Hammer upon it; by which means he found, that tho it was not malleable (at leaſt in the ſtate it then was) like neal'd Silver, ſince it began to crack at the edges like Silver that is over-hammer'd; yet it did really ſtretch under the Hammer, growing more thin on the beaten part, and having viſible Marks or Impreſſions made on it by the edg of the Hammer.

RELATION III.

A Pious and Learned School-Maſter, that ventur'd to ſtay in *London* in the great Plague 1665, and was much Employ'd, as ſome Friends of mine that knew him, and commended him, aſſur'd me, to Viſit the Sick, and diſtribute Alms and Relief to them, went indiſcriminately to all ſorts of Infected, and even Dying Perſons, to the number, as he told me, of nine Hundred, or a Thouſand; and being ask'd by me about the Infection of other things than Walls, he told me, That being once call'd to Adminiſter ſome Ghoſtly comfort to a poor Woman that had Buried ſome Children of the Plague, he found the Room ſo little, that it ſcarce held any more than the Bed whereon ſhe lay Sick, and an open Coffin wherein he ſaw her Husband lye Dead of the ſame Diſeaſe, whom the Wife ſoon

ſoon after follow'd. In this little cloſe Room they affirm'd to him, that the Contagious Steams had produc'd Spots on the very Wall; and when I ask'd, whether he himſelf had ſeen them, he anſwer'd, That he had not; but yet was inclin'd to believe the thing to be true, not only upon the ſcore of the Relators, but becauſe he had obſerv'd the like in his own Study, which being divided only by a Wall from ſome Rooms of a Houſe, which the Owner had turn'd into a kind of a Peſt-houſe, and in which, Numbers had Dyed in a ſhort time; he took notice that the white Wall of his Study was (ſince the Sickneſs rag'd, without any other cauſe that he could imagine) Blemiſh'd in divers places with Spots, like thoſe of Infected Perſons; when (to add that upon the by) I inquir'd what Antidote he us'd; he replied, That next the Protection of God, which ſo many ſad Objects made him the

more

more fervently Implore, and a conſtant fearleſneſs, the only Preſervative he us'd, beſides good Diet, were half a Spoonful, or a Spoonful of Brandy five or Six times a day, eſpecially when he went into Infected places, and the bigneſs of a ſmall Nut, or leſs, of a Root of Spaniſh *Angelica*, of which he held in his Mouth the quantity of a Pepper-corn, or ſomewhat leſs, as often as he thought there was need.

RELATION IV.

An ingenious Perſon, and very worthy of Credit, inform'd me the other day, in anſwer to ſome queſtions that I propos'd to him, That he was Imploy'd ſome years ago by a German Phyſician (whoſe Name he told me) to Diſtil a certain Mineral not unknown to me, which he perform'd in a naked Fire, with ſo good ſucceſs, that he had from about January, 25.

about half a Pound of the Mineral, near ʒIII. of the Liquor; this he included in a Glaſs with a Bubble, and a ſlender neck like one of my Weather-Glaſſes; but tho the Liquor at firſt reach'd not above the Bubble, but only fill'd it to the bottom of the Pipe; yet as the *Moon* increas'd, this Liquor, as the Doctor expected, by degrees expanded it ſelf in the Glaſs, ſo that about the Full-*Moon*, it reach'd about an Inch into the Pipe, and upon the Decreaſe of the *Moon*, it ſubſided by degrees to the bottom of the Pipe. And when I ask'd, whether the Veſſel were carefully ſtopt, he anſwer'd, That it was not only ſo, but Hermetically Seal'd like one of my Thermometers with *Spirit of Wine*, which he had ſeen. This the Relator averr'd to me upon his own Obſervation, and being deſir'd, he readily gave me a deſcription of the Mineral, and a direction where to procure it,

which

(which I am now endeavouring to do) adding that the ſame Doctor made the like Tryal with another Mineral, akin to this, with which my having heard that ſuch an Experiment had been done, gave me occaſion to propoſe him the queſtion.

RELATION V.

An inquiſitive Traveller that not long ſince waited on a German Prince addicted to Chymiſtry, and was imploy'd by him in his private Laboratory; being ask'd by me ſome queſtions about Ore of *Biſmute* or *Tin-glaſs*, whereof there is ſaid to be a Mine in that Prince's Territories, and in particular, whether he had obſerv'd any thing of the varying bulk of a ſtrange Liquor obtainable from it: He anſwer'd me to this effect, That he had had occaſion to make many Tryals upon this Mineral, and that particularly by his Prince's com-

command, he had Diſtill'd a *conſiderable quantity* of a certain ſort of it (becauſe it yields but *very little Spirit*) and that he thereby obtain'd a Liquor, which being by Rectification freed from its ſuperfluous Phlegm, amounted to about half a Pint. This Liquor was put into a Vial, which it almoſt half fill'd. This Vial being exactly ſtop'd, was ſet aſide in a quiet place, where, (as the Prince expected) as the Light of the *Moon* increas'd, from the New-*Moon* towards the Full; ſo this Liquor gradually ſwell'd, and that not in a hardly perceptible degree, but very manifeſtly and conſiderably; ſo that when the *Moon* was Full, the Liquor reached almoſt to the top of the Glaſs, and during her Wane, as the Light decreas'd, ſo did the bulk of the Liquor, which was always leaſt at the New-*Moon*. I ask'd him if any Tryal had been made, whether the Weight of this Spirit

varyed

varied with the Bulk, and he frankly confeſs'd to me, That it had not come into his Mind; but for what is above Related of the Increment and Decrement as to quantity affirm'd to me, that he himſelf, as well as his Prince had ſeveral times Obſerv'd it; and he alſo readily told me the way he uſed in making the Diſtillation, which he ſaid, exacted an intenſe degree of Fire.

RELATION VI.

An inquiſitive Perſon, that having gone through his Studies in the Univerſity, Travell'd throgh divers Countries to make himſelf the more fit for the Profeſſion of Phyſick, anſwer'd me, That having Reſided for ſome time in *Pruſſia*, he had more than once or twice (and that in differing places) obſerv'd, as others in his Company alſo did,

That the Fiſher-men in breaking the Ice of long Frozen places, and taking out thence conſiderable Maſſes of Ice, did ſeveral times find in them Swallows, ſometimes numerous enough, that were ſo inclos'd in the Ice, that unleſs by breaking or thawing it, they could not be gotten out of it. And he further anſwer'd me, That when theſe Lumps or Maſſes of Ice came to be thaw'd in their German Stoves, the Swallows, that lay as Dead before, would Revive, and perhaps fly about the Room; but did not long ſurvive their Recovery out of their Inſenſible ſtate; ſome Dying again in few hours, others the next day, or perhaps the third; but few or none, that he obſerv'd, Living beyond the fourth or the fifth; which immature Death, my Relator judg'd to be caus'd by their having no Appetite to Eat, which Inappetency made them Dye

Starv'd

Starv'd. But as the conjecture may be true as to thoſe that Liv'd for ſome days, ſo it ſeems not like that thoſe that Periſh'd in few Hours, Dyed meerly of Hunger; and as for them that were Starv'd to Death, I ſhould ſuſpect that they were Starv'd, not ſo much for want of Appetite, as for want of ſuch Animals as they us'd to Feed on, eſpecially Flies, which they could not get in Winter.

RELATION VII.

An Inquiſitive Gentleman lately Return'd from *Jamaica*, where he was Imploy'd by the Governour to make Diſcoveries of Natural Things, anſwer'd me (this Morning) that he had ſeen in that Iſland great number of Trees that bear the Silken Cotten, that he found many of them to ſurpaſs in bigneſs and height the

larger ſort of our Engliſh Oaks; and that on a Mountain that many went to Viſit out of Curioſity, to view a ſtupendious Silk-Cotton Tree, he ſaw its Bulk, and many affirm'd to him, and it was the general Tradition of the Country, which he ſaw no cauſe to disbelieve, that this prodigious Tree was in the Body no leſs than 21 yards about, that is, more than 60 Foot in Compaſs.

The ſame curious Traveller told me he ſaw a *Cannow* made of the hollow'd Trunk of one of theſe Silk-Cotton Trees, which after all that had been taken off to give it the ſhape of a Veſſel fit for Service, was 30 Foot about, and of at leaſt a proportionable length.

RELATION VIII.

A Merchant Rich and Judicious, and more addicted to Letters than is uſual to Men of his Calling, being return'd into *England*, from ſome of the remoter Parts of the *Eaſt-Indies*, to ſatisfy my Curioſity about a ſtrange Tradition of ſeveral Navigators about a more than one way extraordinary In-draught of the Sea on the Coaſt of a great Iſland of the Southern Ocean, ſent me the enſuing Relation, which tho it contains ſomething manifeſtly Fabulous, but eaſily diſtinguiſhable from the reſt, I give you in the Relators own Words, being unwilling to alter any thing till I can ſee him again, and propoſe my Scruples to him.

At *Campar* and *Rakan*, on the *Eaſt* Coaſt of *Sumatra*, is in the Rivers Mouth (to a certain di-

ſtance) at each New and Full-Moon, a Violent In-draught of the Sea, (call'd *Bunna*) which approacheth with an hideous noiſe, and Mountain-high, ſo that whatſoever oppoſeth it, Periſheth. Its approach is in three Parts, the firſt high, but not ſo terrible; the ſecond is high, black and horrid; the third is low, and of gentle motion; before its approach, it giveth ſo fair warning, that the People may Eat, and bath themſelves, before they weigh Anchor; but when they weigh, they muſt Row hard againſt it, and when its fury is paſt, follow with it, till they return to their Anchor place. The true reaſon whereof the Inhabitants cannot diſcover: But (as if *Greece* only were not the Mother of Fabulous Traditions) theſe poor Natives Fabulize, That at *Campar* (where is the greateſt *Bunna*) in former Ages, there was a Princeſs, who, to ſhun the Rape of an inſolent *Caffree* Slave, ran

Slave

into the Seas mouth; but the Slave ſtill purſuing her, and after him the Princeſs's *little-Dog*; all periſh'd and thus (by a new *Metamorphoſis*) theſe three Waves perpetuate their Commemoration. That afterwards a bold Fellow hoping to divert this *Bunna* from *Campar* (by advice of ſome Wizards) Row'd up againſt that firſt part of the Torrent, and filling a Bottle of its Water, which he immediately ſtopt up cloſe, he betook himſelf to *Rakan* (not far diſtant) and pour'd it out into that Rivers Mouth, which brought the *Bunna* thither alſo, tho it left not *Campar*; but that Fellow ſuddenly after Dying, none durſt ſince attempt the like, elſe the Natives fancy it may ſtill be done.

My humble Opinion is, (adds my Relator) that the Mouths of thoſe Rivers being choakt up with their Sand-Banks, and ſo render'd very Shallow; when the great Spring-Tydes come roaring

over thoſe Shoals (at the New and Full-Moons) out of the *Malacca* Streights, the firſt Influx is Irreſiſtible, by ſuch ſmall Veſſels as uſe that Port, (eſpecially if attended with dark Weather or Stormy Guſts) ſo that they are forc'd to Weigh and Bear up againſt it for fear of being Stranded and Split. In which Sentiment I reſt, till I can attain a more prevalent Reaſon.

RELATION IX.

A Gentleman that had Travell'd far and Obſerv'd much, related to me, That being off the Coaſt of *Moſambique*, between the 20th and laſt Days of *September*, the Captain of the great Portugal Ship they were in, walking to and fro upon the Deck, Spy'd a great way off, a very little dark Cloud or blackiſh Spot in the Sky: Whereupon, tho the Weather

ther were fair, he made all the haſt he poſſibly could to provide for a great Storm, by taking in the Sails, *&c.* And tho for a while the Sky continu'd clear, and they had no ſigns of an imminent Change; but that when the Cloud approacht, the Wind that had till then fill'd, their Sails ceas'd, and the Sea became Calmer than before: But preſently after they had a furious Hurricane, which turn'd their Ship quite round many times one after another, as if it were an Aerial Whirl-pool, which laſted for above two Hours, and then left them, ſeeming to have a progreſſive Motion, as Whirlpools in Rivers often have.

RE-

RELATION X.

An Ingenious Practitioner of Phyſick, accompany'd by one of the ſame Profeſſion, aſſur'd me with great Aſſeveration, That ſome while ſince, being at a place in the Country near *Amſterdam*, where there Liv'd a kind of a Farmer, who (tho Illiterate enough) was reputed very Curious; this Perſon ſhew'd him, among other things, a conſiderable quantity of Quickſilver that was altogether of the Colour of Gold. And, to anſwer my ſcruple, this Relator added, that the Colour did not belong only to the Surface of the whole Maſs; but having purpoſely (with Water) divided it into many Globules, each of them retain'd the ſame rich Colour. And he further told me, That the poſſeſſor of this yellow Mercury, having put

ſome

ſome of it over a Fire in a convenient Veſſel, it quickly loſt its fludity, and was precipitated into a red Powder; about which he hop'd to learn ſome notable things at his next Viſit to the Author: But that having been too long delay'd; when he came to the place again, he found to his great Grief that the Maſter was Dead, and his Relations were, or pretended to be, ignorant of his Secrets.

A very Learned and Experienc'd Phyſician, made me a Viſit to give me notice, that a few Days before he had receiv'd one in the Night from a couple of Strangers, one of whom by ſome things that he ſaw him do, he judg'd to be (what they call) an *Adeptus*, who beſides a thing far more rare and valuable, ſhew'd him as a Curioſity, a runing Mercury of a lovely Green. And when I ask'd my judicious Re-

lator

lator, whether he had broken the fluid Mass into Drops, to observe whether the Colour were that only of the Surface, or of the whole Mass? He answer'd, that he purposely laid it upon a rough Body, as a Carpet, and found the Globules, whereinto 'twas by this Means divided, to be of the same fine Green that had beautify'd the whole Mass.

These Relations, tho they had come to me from less Credible Persons than those I receiv'd them from, I should not hastily have rejected, because of some odd and fine Colorations of running Mercury, that I have my self Observ'd, but here forbear to mention, because they belong to another Paper.

FINIS.